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ARS ❑ CSREES ❑ ERS ❑ NASS

Manual

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This Manual provides detailed guidance on preparation of case wirtings, and guidance for panelists in the ARS Research Position Evaluation Systems.

A INTRODUCTION

This Manual provides detailed guidance on preparation of case writeups, and guidance for panelists in the ARS Research Position Evaluation System.

B REFERENCES

RPES policies and definitions are explained in Directive 431.3.

C ABBREVIATIONS

ARMS - ARS Resource Management System
CRIS - Current Research Information System
GM - General Schedule Employees in the former PMRS
GNA - Guide Not Applicable (decision)
GS - General Schedule
IDR - Indepth Review or Reviewer
IFB - Insufficient Factual Basis (decision)
NPS - National Program Staff
OPM - U.S. Office of Personnel Management
PRO - Promote (decision)
REF - Refer to Supergrade Panel (decision)
RGEG - Research Grade-Evaluation Guide
RIG - Remain in Grade (decision)
RL - Research Leader
RPE - Research Position Evaluation
RPES - Research Position Evaluation System or (Staff)
SBG - Scored Below Grade (decision)
SPL - Split Decision (decision)
USC - United States Code

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FLOYD P. HORN
Administrator

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Chapter 1, Preparation of Case Writeups

Panelists must have information in sufficient detail to make fair and equitable classification decisions. Information on individual positions and incumbents will be submitted according to the following outline, which is compatible with the format of the RGEG.

The standardized format is an important feature in assuring consistent and equitable evaluation throughout ARS. Case material will be reviewed for adherence to format. Inaccurate, incomplete or improperly prepared writeups will be returned for revision.

This chapter provides (a) an outline of case writeup, (b) an explanation of information requirements and options, and (c) a case writeup submission checklist.

Format of Case Writeup

Cases are to be typed in the format shown below. Numbers in parentheses refer to pages in this chapter where the topic discussion is to be found.

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1. Participation in National Scientific Meetings, Technical Conferences, Workshops, etc.
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1. Educational Background
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3. Research Experience
4. Status
5. Other Significant Information

E. **Publications** (pp. 29-30)

General Guidance

- Before preparing your case writeup, you should review this Manual (including the RGEG) to gain an understanding of each factor's evaluation objective.

- Each element of the format must be included in the case writeup. If you have nothing to report, enter "None."

- In writing Factors I, II, and III use gender-neutral terms and style instead of saying "he," "she," "his," or "her." Begin sentences with action verbs (the subject is understood). Write ***brief*** narrative paragraphs following the outline shown above.

- Format guidance in this Manual pertains to the order and level of detail/ clarity expected in factual information contained in case writeups. There is no intent to specify such typing details as indentation, spacing, etc. Standard usage prevails in such matters.

- All pages following the first page of the case writeup **must** be numbered.

- Be considerate of the panelists who must read and evaluate your case writeup. Use easily-read font sizes and do not try to "squeeze out" extra

space--leave adequate margins on all sides of each page.

CAUTION: UNDUE DETAIL, EXCESS VERBOSITY, AND NEEDLESS REPETITION WILL *WEAKEN* RATHER THAN STRENGTHEN YOUR CASE WRITEUP.

Factor I--Research Assignment--is documented and evaluated via five elements lettered A-E.

A. **Assigned Responsibility**

Identify the organization, location, and general area of work, including the scope and research approach. The limits or boundaries of the area of work should be clearly stated. (The specific objectives within the area are covered in the next paragraph.) When appropriate, state if you are a team member or a team leader. If you are assigned one of the three **formal** levels of leadership listed below, explain fully in this paragraph.

- **Lead Scientists (Level I)** are responsible for the scientific leadership of Level I projects, and report to a Level II RL. In this capacity, the Lead Scientist: coordinates scientific activities of participating scientists; evaluates and recommends (with NPS concurrence) changes to the project(s); prepares annual reports; provides technical information and consultation pertaining to assigned project(s), both internal and external to ARS; and assures that human, fiscal and physical resources assigned to project(s) are utilized as planned. With RL approval, a Lead Scientist may supervise temporary scientists assigned to the project, e.g., Research Associates. With AD approval, a Lead Scientist may supervise other permanent scientists assigned to project(s).

- **Research Leaders (Level II)** head management units and are responsible for exercising leadership and line authority over scientists and support personnel assigned to the unit. An RL reports to either a Level III Director or to an AD. In this capacity, the RL is responsible for: maintaining and enhancing the creativity and productivity of the unit; hiring personnel and managing the human, fiscal, and physical resources assigned to the unit; serving as the unit fund holder; providing technical information and consultation, both internal and external to ARS; and ensuring the proper interpretation and reporting of scientific research results and information.

- **Directors (Level III)** typically exist only where there is an organizational need for research administration to coordinate Level II efforts. A typical Level III assignment would be the Director of a large center or laboratory.

B. **Research Objectives and Methodology**

Describe: (1) the specific objectives within the assigned area of responsibility which will be pursued ***for the next 3 to 4 years***, and (2) the methodology to be used as agreed upon by you and your immediate supervisor. ***If leadership is involved***, distinguish between the objectives of the research team and those of your personal research assignment.

C. **Expected Results**

State the expected results and the impact on science or technology that will result from successful completion of the research described in B above.

D. **Knowledge Required**

Explain the professional knowledges required to perform the duties of the **current** assignment. State required knowledges as succinctly as possible, for example: "The research assignment requires professional knowledge of plant physiology, biochemical engineering, thermodynamics, physical chemistry, biochemical kinetics, tissue-culture techniques and transport science."

E. **Supervisory Responsibilities**

Specific data, (i.e., title, grade level) of employees supervised must be included. All positions having formally delegated and continuing technical **and** administrative supervisory responsibilities over **ARS** employees must include the following:

> "Provides supervision over (***number and types of positions***). Outlines work assignments, provides guidance on procedures and methods to be employed and reviews work in progress. Incumbent is responsible for approving or disapproving leave, giving performance evaluations and making recommendations concerning personnel actions. Assures that equal opportunity is extended to employees supervised which includes full consideration of eligible minority group members and women in filling vacant positions; holding individual and group meetings to communicate equal employment opportunity and program missions; providing career counseling and orientation; enhancing career opportunities through training and development, job redesign and similar techniques; and ensuring full and equal consideration of these employees in recommending promotions, awards, and other forms of special recognition."

Do **not** include data on numbers of State, contractor, cooperator or other employees you oversee. Such relationships are neither legally recognized nor creditable.

Subchapter 2 - Factor II

Factor II--Supervision Received--is documented and evaluated via four elements lettered A-D.

A. **Assigned Authority**

Summarize your freedom to do research and make decisions within the scope of the assignment. Include a statement about the complexity and/or alternative research approaches when the scope of, and freedom within, the assigned area permits such choices.

B. **Technical Guidance Received**

Describe the general **technical** supervision received. Technical refers to the theoretical, experimental, and practical aspects of **planning** specific research activities in the assigned area of responsibility.

C. **Review of Results**

Describe the supervision received (freedom given) to analyze, interpret, and report results, **and** the nature and extent of your supervisor's review of manuscripts.

D. **General Supervision**

Describe the broad supervision received, such as frequency and nature of contact with the supervisor, and your authority to make changes in the program or commit resources (personnel, supplies, equipment, budget, etc.).

Subchapter 3 - Factor III

Factor III--Guidelines and Originality--is documented and evaluated via three elements lettered A-C.

A. **Available Literature**

Indicate the extent to which literature applies to the assigned area, the specific objectives currently being pursued, and the methodology being used.

B. **Originality Required**

Indicate the difficulty in identifying specific objectives or hypotheses or expected results, and converting abstract concepts to easily understood statements or theories. If appropriate, the extent to which new areas of investigation might be opened should be described to help reflect the originality required.

The above information constitutes your official position description, and should be limited to no more than three single-spaced pages. Factor IIIC and Factor IV complete the case writeup.

Begin Factor IIIC on a new page with the heading shown below.

Factor III - **Guidelines and Originality**

C. **Demonstrated Originality**

In a **brief** paragraph describe the originality and creativity demonstrated by you that are applicable to the research assignment and are considered your **best** evidence of originality related to the **current** assignment. Some specific accomplishments should be cited, but ***do not restate all the accomplishments listed under Factor IV or go into needless detail***.

Subchapter 4 - Factor IV

Factor IV--Qualifications and Contributions--is documented and evaluated via five elements lettered A-E.

Factor IV is the single most important segment of the case writeup. It implements the "person-in-the-job" concept which underlies the RGEG, and is double-weighted in terms of point value when compared to the other factors.

> **NOTE**: Factor IV is considerably more complex than the other factors, and its elements require correspondingly greater explanation. ***Unlettered subheadings in this section are solely to provide clarification or examples of topics under discussion, and are not to be used in formatting case writeups***.

Optional Introductory Paragraph

You may opt to begin this factor with a **brief** paragraph summarizing your research career by listing total years in research, total number of publications and presentations, and a general statement about your reputation and recognition **if** these are significant and appropriate.

Do **not** submit previous position descriptions as part of the case writeup; summarize the past assignment instead. (See instructions in Section IV D 5 below.)

If there is nothing to report under one or more elements of Factor IV, include the number and title of the element. Under the element, state "none" or "nothing to report." The reviewers will then know the material was not overlooked or inadvertently omitted.

A. Demonstrated Accomplishments

General

Immediately following the optional introductory paragraph, select and list--from earliest to latest in chronological order--the most significant research accomplishments ***over your total career***. A limit is imposed on the total number of accomplishments which can be claimed and documented, based on the scientist's current grade level:

- GS-11 and below, a maximum of three (3)
- GS-12, a maximum of five (5)
- GM/GS-13 and above, a maximum of eight (8)

Writing Accomplishment Statements

Impact is the core value of RPES, and assessment of impact begins with careful selection and documentation of original contributions to a field of science or technology, or to ARS programs. Bear in mind that the actual impact of an accomplishment sometimes changes with time--often it is not apparent for some

time after an accomplishment has been achieved--so great care and precision in writing are required.

Each selected significant accomplishment must summarize the following information in ***a brief, concise paragraph:***

> ***What was accomplished***? Emphasize what was done, but not how it was done. ***What was your role*** in the accomplishment? This is particularly important for accomplishments involving a team effort (see discussion below). RPES is a position classification system, and cannot evaluate group activities. It is therefore necessary to describe as accurately as possible what you contributed to the total accomplishment. Finally and most importantly, ***what is the impact*** on science or the degree of adoption, or economic or program importance of the accomplishment? Where appropriate, specify the customer(s) who benefitted from your work.

To assure that the requisite information is evident, ***imbed the subheadings at the appropriate points in each paragraph***, as shown in the samples. Note that the ***accomplishment and role subheadings may be linked*** in accomplishments where you acted alone.

The intention is to keep accomplishment statement paragraphs ***terse and factual***. Therefore, each paragraph should not exceed one-third of a page in length. (**Remember the caution against verbosity**--wordiness and too much detail do not help!)

Number accomplishments in chronological order.

Identify accomplishments since last promotion (or entry on duty with ARS) with an asterisk.

> **NOTE**: Past accomplishments are generally accepted, but recent accomplishment is important to indicate continuing research competence. For RPES purposes, **"recent" is defined as the interval since the last panel evaluation**.

Documenting Accomplishments

For each accomplishment, select supporting documentation, termed "exhibits". Research accomplishments are generally documented with publications (i.e., peer-reviewed journal articles, patents, CRADA's, technical reports, germplasm releases, review articles, etc.). Other types of accomplishments are more appropriately documented by supporting statements, as discussed below and shown in the accompanying table.

Exhibits must be referenced to the particular accomplishment documented and--in the case of publications--to the publications list, e.g., "Exhibit 1, #3; Exhibit 3a, #6; Exhibit 3b, #8; Exhibit 4, #10;" etc., and **labeled accordingly**. Publications related to an accomplishment but of lesser importance than the exhibit(s) will only be referenced to the publication list, e.g., "#28, #34, and #40."

Whenever an accomplishment is not or cannot be appropriately documented with a publication, a maximum of three (3) concise statements signed by some knowledgeable authority such as NPS staff scientist, technology transfer

coordinator, action agency official, industry or commodity group representative, AD, etc., are acceptable as exhibits. S**uch statements must contain substantive information**. They must provide evidence to support the summary and particularly the ***impact*** of the accomplishment. For research accomplishments, the statement(s) must also indicate why the research was not or could not be published.

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Accomplishments may also be documented by a ***mixture*** of publications and supporting statements, provided the maximum of three total exhibits is not exceeded.

> **NOTE**: Impact may also be addressed by attaching multiple supporting statements to a cover memo signed by the AD. The AD's memo must state that "the attachments indicate Dr. _____'s impact with regard to [identify the nature of the accomplishment]" Such memo/attachment combinations are counted as a single exhibit. Supporting statements are otherwise counted as individual exhibits.

Patents are an important means of documenting certain applied research and technology transfer accomplishments. In addition to including a copy of the patent as an exhibit, the writer should summarize information about the significance of the patent (i.e., improved products, economic savings, etc.) in the accomplishment statement. For additional information on patents, see Subchapter 5 of Chapter 2 of this Manual.

Exhibits should be selected with the following in mind:

- Exhibits must support statements of your role and impact of the work on science, technology or programs.
- A **maximum** of three (3) exhibits may be used to document each accomplishment. (**Copies** of exhibits are preferred over originals, since exhibits are discarded after the panel meeting.)
- There is no requirement to "fill the quota" with the maximum number of allowed exhibits.
- Full credit for an accomplishment cannot be given when the accomplishment is documented **solely** by abstracts.
- Serial articles ("Part I, Part II," etc.) are counted as separate documents when used as exhibits.
- **If you are using a book as an exhibit**, submit only one complete book. With your case writeup, submit seven (7) photocopied sets of the table of contents, introduction or other appropriate summary sections. These photocopies will be discarded after the meeting. RPE Staff will assure the book gets to the designated indepth reviewer for your position. (If you so specify ahead of time, RPE Staff will also arrange to have the book returned to you after the panel meeting.)

- **If you are submitting a disk as an exhibit**, be sure to include instructions for accessing the material on the disk.

Table of Illustrative Exhibits	
Type of Accomplishment	**Typical Exhibits**
Research	Journal articles, technical reports, germplasm releases, supporting statements from user groups/action agencies
Special Assignments or Projects	Supporting statements from NPS and other program authorities
Technology Transfer	Patents, videotapes, cooperative research and development agreements, germplasm releases, supporting statements from user groups/action agencies
Systems Research and Integration	Manuals or diskettes of simulation models, journal articles, technical reports, supporting statements
Leadership (RL and Scientific)	Supporting statements from Area Director, NPS, user groups/action agencies
"Additional"	Not permitted

Variety of Accomplishments Recognized

RPES recognizes and credits a wide variety of accomplishments ***when properly documented***: knowledge development, knowledge application, method development, literature review/analysis, technology transfer, leadership (research leadership and scientific leadership), systems integration/modeling, and special assignments. The type(s) of accomplishments you select will naturally depend upon your past and present assignments.

- **Research**

  Research accomplishments are "expected" of research scientists and the documentation is well understood.

  Examples:

  Accomplishment: Wheel traffic compaction in no-till may reduce nitrogen fertilizer uptake by corn plants. To address this problem the incumbent led a team in designing and conducting a field experiment that examined the combined effects of tillage, fertilizer placement, and wheel traffic on corn shoot and root growth, N uptake efficiency, and yield. Wheel

traffic from moderate-size farm machinery (4.5 metric tons axle loads) reduced the growth of roots in tracked interrows. As a result, corn roots took longer to reach N fertilizer placed in tracked interrows and this fertilizer was

then susceptible to leaching for a longer time. Additionally, placing fertilizer closer to the plant row resulted in more rapid shoot growth prior to anthesis. **Role**: Incumbent conceived, planned and directed the research, and wrote the manuscript. **Impact**: This research was the basis for three journal articles and two invited presentations and has been incorporated into Iowa State University Extension recommendations on nitrogen fertilizer placement. (Exhibit 1a, #25; Exhibit 1b, #34; Exhibit 1c, #38; and #46)

Accomplishment/Role: The incumbent postulated that direct mechanical inoculation of the vascular tissues in seeds will bypass the need for vectors to transmit maize viruses. This elegant, unconventional and simple approach resulted in a highly efficient method for transmitting MWLMV and the first mechanical transmission of intractable maize viruses such as maize chlorotic dwarf virus, maize mosaic virus, maize rayado fino virus, maize rough dwarf virus and maize streak virus. **Impact**: Among other benefits, this research provided a unique solution to study viruses without the confounding effect of vectors, eliminated or reduced the intensive labor requirements of insect rearing, expedited tests on infectivity of virus preparations, provided a means to study the mechanism of resistance to systemic virus movement and to study virus resistance independently from vector resistance, and facilitated studies that manipulate recombinant viral clones. (Exhibit 8a, #85; Exhibit 8b, #92; and #87)

NOTE: ARS acknowledges the value of risk-taking when appropriate to the mission. This means that negative or partial results are recognized as potentially having an impact on science as great as positive results in other contexts. Limited impact is more appropriately associated with limited relevance, lack of originality, or poorly planned and executed research.

- **Team Research**

The RGEG--and therefore RPES--assess the impact of a scientist's contributions to science and technology, and the extent of stature and recognition resulting from that impact.

RPES seeks to determine the appropriate level of credit for contributions made as part of a team in the same manner as for individual research achievements. RPES is a system for classifying **individual** research positions. If your assignment includes being part of a team, you must be specific in showing ***your contribution to the team accomplishment***. Team responsibilities may be assigned formally or they may develop informally.

Explaining contributions as a team member is sometimes difficult because the

team concept emphasizes unity and cohesiveness. In writing the accomplishment statement, you **must** address your individual participation in, and actual contribution to, solving the problem in terms of conceiving the study or defining the study objective, defining hypotheses to test the approach, interpreting data, reporting or otherwise transferring the results, or comparable activities.

Impact is the key consideration in describing team research accomplishments. Impact is a question of the value and use made of a given contribution. It is neither measurable by nor synonymous with publication or authorship. IDR's are specifically tasked to determine an incumbent's relative contribution in team research and student/professor situations. Such situations are widespread throughout science and not considered unusual by experienced panelists.

Examples:

Accomplishment: In team research, the incumbent and her coworkers determined the mode of action and compared the efficacy of two insect growth regulators on the cat flea. Pyriproxyfen was found to be the most photostable of two juvenile hormone mimics. Both compounds disrupted embryonic development when applied to the adult female flea. In addition, exposure of flea eggs to treated pet fur for as little as only one minute disrupted either embryonic or larval development, depending upon the IGR used. **Role:** The incumbent led the histological portions of the studies and participated as a full team member in other aspects of the work. **Impact:** This research demonstrated that the high susceptibility of flea eggs to these products was due to a unique, previously unreported, non-sclerotized chorion in flea eggs that consisted only of a gelatinous material overlaying the developing embryo. The results of this research are important because they suggest new approaches for controlling fleas by attacking the vulnerable egg stage. The data are being used in evaluating this product for registration and commercial use on domestic animals. (Exhibit 7a, #57; Exhibit 7b, #59; Exhibit 7c, #60)

Accomplishment: In cooperative studies with university personnel and his Research Associate, the incumbent examined the impact of global climate change on hydrology and erosion. Using three climate change scenarios the impact in increased precipitation and decreasing winter temperatures was evaluated on water resources of a mixed land use basin. Depending on the scenario, water yield increased from 101% to 245%, while the sediment yield increased from 121% to 266%. In another study climate change scenarios were developed using trends in the climate data for 14 sites across the continental U.S. and Alaska. Using WEPP and CREAMS models, runoff and soil loss were simulated at each site with and without climate change. Relative impacts of these generated climate changes in soil loss ranged from -35% at a site in Alaska to a 40% increase at an Oklahoma site. **Role:** The incumbent developed analytical procedures to organize and present the data to demonstrate the impact of climate change on runoff and erosion.
Impact: Results from these studies demonstrate that small differences in precipitation and temperature trends significantly impact soil loss and sustained agricultural production. (Exhibit 7a, #51; Exhibit 7b, #54)

- **Special Assignments and Projects**

  Such activities are considered related or complementary to assigned research. They are credited when:

  A. The accomplishments have impact on science, technology or Agency programs equivalent to that of the conduct of research; or,

  B. The accomplishments maintain the scientist's level of expertise, allowing full credit to be given for past research accomplishments.

  The mission of ARS is to conduct research, solve problems of United States agriculture, and effectively communicate its results. Work will be assigned to positions in order to achieve mission goals with maximum effectiveness and efficiency. Accordingly, complementary service projects will be assigned to Category 1 positions when one or more of the following conditions exist: funds or personnel ceilings are not available to hire additional persons; the volume of work is not sufficient to justify establishing an additional position to perform it; the activity is a natural followup to the research; or, technical requirements prohibit others from doing the work.

While ARS allows researchers to impact the classification of their positions, there are some constraints due to the nature of each position. Each position is established **primarily** to perform a part of ARS' mission, and only secondarily to provide avenues for possible personal advancement depending upon how the position and work can be organized. There is a clear distinction between pursuit of an Agency objective--even if not complete or fully successful--and a scientist pursuing his/her own, or no, goal.

Documentation of research-related activities is **essential** for proper credit. The position description must include a brief paragraph on the duties and responsibilities for ongoing complementary assignments. Factor IV of the case writeup must mention completed projects and accomplishments. They may be included either as (a) a substitute for a research accomplishment (when impact is comparable to a research accomplishment, or when it fills a gap in recent research accomplishments), (b) an "Other Accomplishment" beyond the three to eight Demonstrated Accomplishments, or (c) a supporting statement in (Sections IV B or C) which provides further evidence of your acceptance, impact, and recognition.

Examples:

> **Accomplishment/Role**: As a technical consultant, conducted a field study to solve an urgent and critical problem and prepared a handbook of recommendations (Exhibit 7b) which applied methodology developed earlier (Exhibit 7a). **Impact**: This ARS handbook has been distributed widely among the users and has been commended by the industry (Exhibit 7c).
>
> **Accomplishment/Role**: As Project Manager for 2 years, established a new location and program for research, monitored completion and acceptance of the new facility, established research programs and position descriptions for six research scientists and six support staff, and interviewed and selected staff. **Impact**: Although there are no publications resulting from work at the new facility yet, research is well under way. (Exhibit 8a, letter from Area Director indicating current appointment as Research Leader now that the project is done; Exhibit 8b, descriptions of research programs; Exhibit 8c, copies of CRIS progress reports)
>
> **Accomplishment/Role**: At the request of the Department of Defense (DOD), applied techniques to develop new methodology to . . . . **Impact**: Because this defense project was security classified, no publications were allowed; however, the work was successful. (Exhibit 4a is a general description of the project objective; Exhibit 4b, a letter from my supervisor assigning the project; Exhibit 4c, a letter from DOD accepting the results)
>
> **Accomplishment/Role**: As Germplasm Curator for the _____ crop, coordinated evaluation of _____ hundred germplasm accessions and consolidated the data into a report distributed to scientists working with the crop. **Impact**: The report has stimulated increased use of the germplasm to broaden the genetic base of the crop in the United States. (Exhibit 8a, letter from State Agriculture Experiment Station scientists/ Director documenting use of the report and of the germplasm lines; Exhibit 8b, letter from plant breeder from _____ Seed Company documenting utility of the report and the new germplasm in their program;

Exhibit 8c, copy of the germplasm report).

- **Technology Transfer**

Technology transfer may constitute a **separate** accomplishment, but more often is a part of the impact of other accomplishments. Transfer is best explained by stating that the technology was transferred and by summarizing the resultant impact. Supporting documentation may take the form of statements from supervisors, user groups, industry or action agencies, or Technology Transfer Coordinators.

Technology transfer is a culmination of all ARS activities. It emphasizes the translation of research results into viable products, processes, and services. Scientists' involvement in technology transfer encompasses a variety of activities, such as:

-- Direct communication concerning their research discoveries with industry scientists, Extension and other action agency personnel, producers, food processors, etc.

-- Joint research with potential users of their research results including cooperative research and development agreements (CRADA's).

-- Publication of manuscripts in peer reviewed journals and other printed media.

-- Presentation of papers and participation in poster sessions at professional society and industry sponsored meetings and conferences.

-- Participating with the Office of Technology Transfer in disclosing inventions as well as preparation and prosecution of patent applications, CRADA's and licensing agreements.

-- Holding technology transfer meetings (e.g., field days, open houses, workshops, conferences, etc.) at ARS locations and/or sponsored by industry or professional societies.

-- Preparation of interpretive summaries for the ARS Form 115 which along with the technical abstract are included in the TEKTRAN database.

-- Assisting ARS Information Staff in preparation of articles, news releases, newsletters, video and radio tapes, etc.

Technology transfer is considered a research-related activity for classification purposes. Crediting such activities for research positions is based on the philosophy that the RGEG assesses a research accomplishment by measuring its impact on science or technology; and both impacts are achieved by the same person.

NOTE: While technology transfer is an ARS mission, it is **not** intended to be the major or sole assignment of any research scientist position. Positions which are **primarily** involved in performing technology transfer duties **cannot** be evaluated by the RGEG. Research positions performing technology transfer duties as an ongoing, permanent assignment must document that fact with a duty statement in Factor I of the case writeup.

Examples:

Accomplishment: As team leader established, developed, equipped, staffed, trained and directed an ink research program at the request of the American Newspaper Publishers Association and the American Soybean Association and by Congressional mandate. **Role**: The incumbent with a research associate

conducted research in which soybean oil and other representative commodity seed oils were modified to exceptionally light colored, biodegradable (#156), and hydrophobic polymers that are used directly as non-petroleum vehicle to formulate lithographic and letterpress inks of superior quality and cost competitive with petroleum based inks (#133, #136, #140, #144, #145). **Impact**: The technology was demonstrated, through a CRADA, to the satisfaction of a major ink manufacturer for all four colors used by the industry. With a potential market of 500 million pounds of soybean oil, the economic impact is extremely significant. The technology has been patented (#147) with foreign rights protected, and numerous national and international companies, expressing interest, have been referred to the ARS Licensing Coordinator. One nonexclusive license was issued August 1993. Further, the research has been recognized by receiving the team USDA Distinguished Service Award, 1992; the incumbent received the American Soybean Association, Domestic Marketing Award; and has received numerous requests to discuss the research and present lectures. (Exhibit 8a, #136; Exhibit 8b, #144; Exhibit 8c, supporting statement from American Newspaper Publishers Association)

Accomplishment: Coordinated national project to develop models for analyzing insects as vectors of hardwood disease. **Role**: Solicited participation of ARS and SAES entomologists and foresters, arranged and conducted a workshop, coordinated lead scientists in assembling constituent models and edited a comprehensive publication on the model. Organized and conducted technology transfer workshops with APHIS, FS, and the Agricultural Simulation Systems Institute regarding the model. **Impact**: Development of the model was selected as the most significant research accomplishment in entomology during 1992. Incumbent received a superior service citation for development and technology transfer of the model. Incumbent's personal technology transfer efforts have resulted in widespread acceptance and application of the model by FS, APHIS, EPA, BLM, numerous State universities, consulting firms and foreign countries. (Exhibit 4a, #51; 4b, #64; 4c, #66; and #43, #46, #49, #50-61)

Accomplishment/Role: At the request of the Animal and Plant Health Inspection Service (APHIS), developed a set of standards and procedures for determining the potency, safety and efficacy of Marek's disease vaccine. The work involved analysis of related in-house experiments as well as consultation with officials in ARS, APHIS, and industry. A written proposal was prepared (Exhibit 1a), submitted to APHIS and subsequently adopted for use with only minor revisions (Exhibit 1b). **Impact**: These recommendations and standards have received the endorsement of industry as documented in correspondence from industry officials (Exhibit 1c).

Accomplishment/Role: Developed a computer-based Indexing System (Exhibit 7) for insect and mite systematics. **Impact**: Greatly enhanced the capability of Federal, State, and private researchers to conduct taxonomic research, and to support regulatory and economic entomology.

- **Systems Research and Integration**

Positions in which modeling and systems research and integration constitute a major component of the assignment are classified under the RGEG. Formal aspects of such positions are described in Factor I of the

position description, and credit is given in that factor and Factor IV for such activities. Formal modeling accomplishments are best documented in the form of one or more Demonstrated Accomplishments. Supporting exhibits may consist of all types of publications, simulation models, expert systems and statements from the modeling coordinator, National Program Leaders and other knowledgeable persons.

Scientists who perform modeling typically develop the means for integrating scientific knowledge of agriculture production, processing and marketing into systems that optimize resource management and facilitate transfer of technology to users. These positions normally emphasize quantification, simulation and validation to produce models of individual systems or subsystems which account for interactions among components of dynamic systems.

"Systems research" is the term often applied to quantification of interactions among components of complex systems. This research may be aimed at predicting system behavior, improving control, or designing new systems that will operate more efficiently. Simulation models based on physical, chemical and biological processes may be the only means for predicting the impact of alternative management actions in real agricultural systems. Most of the important variables in such systems simply cannot be subjected to independent experimental manipulation or control.

Following are some criteria that are useful in evaluating modeler positions and systems research projects:

- Does the model raise researchable questions? Look for instances where model development identifies knowledge gaps or where testing of the model leads to additional hypotheses.

- Does the model attempt to incorporate current or latest knowledge? Check to see if the references listed in the model documentation are representative of the most recent research appropriate for meeting the model objectives.

- What is the scope or complexity of the problem addressed by the model? Examine the number of variables, organisms, and mechanisms treated explicitly by the model. Assess how widely the model might be used in terms of climatic zones, soil types, crops, breeds of livestock, or combinations of these and other variables. Check to see if the model incorporates basic scientifically sound processes that will apply broadly, or if it is based on empirical relationships that have a limited scope of applicability.

- Does the model represent an original scientific ideal or approach? Determine whether and to what degree the model is a refinement or extension of earlier work, or is entirely new. Project the scientific impact the model might have in promoting new lines of research or resolving intractable problems.

- To what extent has the model been, or can it be, adopted by users? Determine how many other scientists or people in action agencies, industry, extension, etc., may be using the model. Assess the ease of using the model.

- Did development of the model foster Agency objectives of promoting inter- or multidisciplinary research on regional and national problems? Look for the different disciplines involved in the model development and locations of the scientists.

- To what extent did the model meet the objectives originally stated?

This question might be answered in terms of time and/or staff hours required, balance among model components, ease of operation, and testimonials from intended users or other scientists.

Examples:

Accomplishment: Led a national team of 15 scientists that developed the Nitrate Leaching and Economic Analysis Package (NLEAP) model. NLEAP was developed for use nationally to identify potential nitrate leaching hot spots and determine nitrogen management strategies to protect groundwater quality. **Role**: Incumbent was responsible for basic design, selection, and implementation of appropriate simulation algorithms; for design and implementation of user interface and expert system for interpretation of model results; and for model testing and validation. In cooperation with other scientists (incumbent 50%), field validated model on 30+ sites in some 15 states. **Impact**: NLEAP model was published in 1991 by the Soil Science Society of America as part of a nitrogen management book, thus becoming the first computer software to be published by the society. SCS and other users such as consultants, conservation districts, State agencies, and universities, have adopted NLEAP as a management, analysis and/or training tool. SCS is committed to adoption of NLEAP technology in their field offices through FOCS and as a tool for developing field office guides. Currently, there are 90+ major groups using the model in the United States and in foreign countries. NLEAP research was recognized in June 1992 with USDA Unit Award for Distinguished Service (incumbent was group leader). Incumbent's NLEAP research also was recognized with 1992 Scientist of the Year Award for the Northern Plains Area. (Exhibit 5a, #69; Exhibit 5b, #89; and #66, #67, #70, #71, #83, and #84)

Accomplishment: Developed statistical procedures to facilitate both within-herd and across-herd genetic evaluation from performance data in swine. This procedure integrated past research on breeding objectives and a statistical methodology that has the statistical properties of Best Linear Unbiased Prediction (BLUP). **Role**: The incumbent provided leadership on statistical methodology and adaptations and guided the post-doctoral who did most of the computer program development. Others led coordination with breeds organizations and development of educational material. **Impact**: A main thrust of this activity was to make the procedures recursive and available on small computers such as the business-type computers used by swine breed associations. In this form, a considerable body of quantitative genetic technology is made available in a practical usable form to swine breeders with limited technical training. All eight swine breed associations in the U.S. have implemented this collection of procedures and make it available to their members under the acronym STAGES (Swine Testing and Genetic Evaluation System). Over 200,000 performance records have been processed to date by this software on the breed computers. (Exhibit 6a, #73; Exhibit 6b, #74; Exhibit 6c, #92)

Accomplishment/Role: The incumbent researched plant responses to high carbon dioxide concentrations and modeled the responses. He showed how high CO_2 increases photosynthetic rate and decreases transpiration rate to different extents in various crops, how the increased carbohydrate availability affects the size, weight, and number of each organ, and how CO_2 interacts with other factors to determine yield. **Impact**: Incumbent is often asked to advise the principal investigators of individual projects, Department of Energy program managers and members of the NPS about the course and status of the program and about future requirements. Since 1984, incumbent has provided leadership in the USDA/DOE program on crop response to CO_2, by defining the data and

experimental work needed to develop the models to simulate crop growth and yield in a future high-CO_2 world. The incumbent is Project Leader in the Ecosystem Dynamics part of the ARS (special emphasis) Global Change Research Program. This work has resulted in invitations to author 5 book chapters, speak to 6 conferences, and attend 12 planning meetings. (Exhibit 6a, #51; Exhibit 6b, #55; and #27, #32, #35, #36, #37, #38, #41, #45, #48 and #65)

- **Leadership Accomplishments**

Research positions which also perform leadership duties are classified by reference to the RGEG when the conduct and leadership of research constitute a major component of the assignment. Formal supervisory and managerial aspects of such positions are described in Factor I of the position description, and credit is given in that factor and in Factor IV. Scientists having formal leadership responsibility are **encouraged but not required** to list at least one (1) leadership accomplishment as part of their current grade-level quota. Supporting exhibits normally consist of statements from supervisors, National Program Leaders and other knowledgeable persons.

NOTE: The General Schedule Supervisory Guide is applied to research positions **solely** to determine whether or not the term "Supervisory" must be part of the official position title.

In some cases, formal leadership responsibilities are not specified in Factor I, but an individual is truly a leader in the scientific community. In such instances, ***scientific leadership consists of actions, apart from supervisory and managerial duties, which promote research activity on the part of other scientists and lead that activity in desired directions***. Scientific leadership is properly documented and evaluated as part of Factor IV, in the same manner as for formal leadership accomplishments. Scientific leadership accomplishments may be submitted by scientists whose positions are **not** officially designated as supervisors or RL's. The governing criterion in such instances is that the scientist substantiate, by credible documentation, the fact that he/she did achieve a leadership accomplishment as defined herein.

While the RGEG specifically identifies its appropriateness for leadership positions, no specific examples of leadership accomplishments are given in the degree definitions of Factor IV (see RGEG, pages 28-29). All specific references to research accomplishments are those identified with the personal performance of research, although adequate reference is made to recognition and stature of a leader. The RGEG does adequately deal with leadership positions in Factors I, II, and III. As stated on page 13, "In the case of a true team leader... a level should be credited which reflects the scope and character of projects conducted by this team."

Thus, **a formal leader gets credit for leadership responsibilities as soon as he/she enters the job. Getting credit for leadership accomplishments in Factor IV, however, is another matter**. A typical perception by many ARS scientists is that the time required for formal leadership activities prevents them from making personal research accomplishments that they could have made if not in a leadership position; therefore, they may lose or at least not gain additional credit in Factor IV over time when in a leadership position.

There are various types of leadership accomplishments. A leader may take actions to maintain program excellence or to improve team performance. A leader may take action to redirect research programs as a result of Agency mandates or the leader's initiatives. A leader may take actions to accomplish special projects, such as the acquisition of resources, that promote research. A leader may take actions to coordinate a team of scientists over which he/she has no formal supervisory authority in a way that achieves program excellence or

impacts national programs or policies. Evaluation of such accomplishments must consider both the actions attributable to the leader and the impact of the accomplishments.

If actions taken by the leader are not very effective or if the impact of the accomplishment is minor, leadership credit should be minimal, even if the leader "tries hard." The situation is no different than for a personal research accomplishment. Credit is not appropriate just because a scientist "tries hard."

The actions taken by the leader are evaluated for innovation and effectiveness, but the level of credit assigned should be proportional to the impact. Innovative actions that result in accomplishments with little impact should receive little credit. Except for the nature of the accomplishment (indirect rather than direct), a leadership accomplishment should be treated no differently from a personal performance accomplishment when assigning level of credit.

Some criteria to assist in evaluating the various types of leadership accomplishments follow. Because leadership can occur at all levels (I, II, III), the word "group" is used as a generic term to describe a team, management unit, laboratory, institute, or other appropriate grouping of personnel.

Group or individual productivity/effectiveness

Is there a change in the performance of a member(s) of the group? Look for a change in the productivity of the individual(s) as evidenced by such things as publications (quantity or quality), initiation of new research approaches, thrusts or programs, cooperation with other scientists in the group, or acquisition of outside funds.

Is there recognition of the scientists in the group? Look for increased invitations, more advisory and consultation activities, awards for the scientists, an increase in society participation and other such activities. Is there evidence that the Agency is utilizing the talents of its scientists in research-related activities?

Is there an increase in the productivity of the group? Look for evidence that members of the group receive proper credit for their activities. There should be items such as new programs, publications, development of teams for new projects, or reassignment of individuals to new or old programs. Consider the size and diversity of the group led.

Is there an improvement in the quality of the output from the group? Look for the impact of results from the group. This impact may be an acceptance by other scientists, the Extension Service, other user agencies or industry, for example. Awards to the group may also be indicative of quality research.

If the leader is head of an already productive group, has that individual maintained the high level of productivity over a significant period of time? What specific actions were taken to assure maintenance of program excellence? It is recognized that maintaining a high level of excellence may demand as much or more good leadership as that required to turn an unproductive group around.

Is the leader acting as a mentor? Look for items such as giving assistance (where needed) to members of the group on specific research programs, providing opportunities for development (training, sabbaticals, etc.), sharing

ideas or helping to set goals (especially for new members of the group).

Has there been recognition of and/or support for the activities of the group by organizations outside ARS? This recognition could be a use of the findings by farmers, action or regulatory agencies, industry, universities, other scientists or by financial support from these and other groups.

Is the group attracting visiting scientists, graduate students, post doctoral candidates, sabbatics, etc.? Look for evidence that other scientists want to work with people in that group.

Initiation/execution of program redirection

Has the leader initiated or implemented a needed or required change in program direction? How responsive was the leader to Agency expectations or mandates? Was the disruptive effect minimized? To what extent were negative effects on morale minimized? Look for changes in the number and kind of personnel, facilities and equipment in the group, and whether the changes improved the effectiveness of the group. The leader must work well with employees at all levels in the organizational structure.

Scientific leadership

Does scientific leadership extend outside the group? Look for the impact the individual has had on the programs of other scientists, groups or agencies. How dependent is the leadership role on the stature of the incumbent? Because of the individual's knowledge and/or stature, the impact may cause a change in direction or an acceleration in effort in a major research area.

Examples of leadership accomplishments:

> **Accomplishment/Role**: The incumbent as Research Leader has increased productivity of a poorly-performing unit through personal initiatives. During the past 7 years, he has replaced 3 of the 8 unit scientists. Difficult disciplinary and deficiency problems were successfully solved in 4 other cases. **Impact**: These personnel actions resulted in a significant increase in productivity as measured by the number of publications. The high quality of research of the present staff is demonstrated by invitations to present research findings at national and international meetings, election to society fellows and service as journal editors. In the last 2 years, scientists in his unit have received numerous awards including the Distinguished Service Award. Unit scientists have held leadership positions in various national and international research efforts. At present the unit has an effective and coordinated research program with an enthusiastic and productive staff. (Exhibit 8a, support statement from National Program Leader; Exhibit 8b, letter from cooperator; Exhibit 8c, letter from Area Director)
>
> **Accomplishment/Role**: The incumbent was appointed Research Leader of the Grain Quality Resource Unit 8 years ago. Prior to this appointment, the unit was recognized as exceptionally productive and many of the 7 scientists had received personal recognition for their research. Since assuming leadership, the incumbent has filled 3 scientist vacancies, coordinated CRADAs with two international companies that have generated funds to support 2 graduate students and 2 postdocs, initiated a new food safety program resulting from an NPS program increase, and developed new collaboration with scientists in 10 different laboratories. She has improved communications between scientists and support staff, which has improved morale throughout the unit. **Impact**: The unit productivity has remained at an exceptionally high level. Technology developed by the unit has been widely utilized by the Food Quality Council. One of the new scientists received recognition as an Early Career Scientist by ARS.

(Exhibit 8a, letter from Area Director; Exhibit 8b, statement from National Program Leader; Exhibit 8c, statement from the Food Quality Council)

Accomplishment/Role: Upon assuming duties as Research Leader, the incumbent undertook a number of initiatives to expand and redirect the research effort of a team of highly capable scientists whose work was impacted by a shift in Agency research priorities. **Impact**: The redirection took place without significantly affecting the scientific atmosphere, staff attitude, and team productivity in spite of unavoidable disruptions caused by needed modification of the physical plant and concomitant safety issues. Through the incumbent's efforts, regional representatives of the NRCS were collocated with the Research Unit thereby enhancing the redirection of research efforts and facilitating transfer of new technology. The incumbent was awarded a Certificate of Merit for exceptional handling of program changes, and during her leadership tenure cooperation between the NRCS and ARS staff were significantly streamlined. (Exhibit 8a, statement from Area Director; Exhibit 8b, statement from National Program Leader)

Accomplishment/Role: A poultry vaccine was discovered to contain a passenger virus (R) which was causing detrimental effects. Because of his nationally recognized expertise with R virus, the incumbent was asked to address this issue. He facilitated the transmission of data showing the contamination through the grower to the vaccine company, assisted the vaccine company in validating the status of the questionable vaccine, and assisted APHIS by providing technology and data on detection of the R virus. **Impact**: The incumbent was invited as a consultant by the National Broiler Council technical committee and led an informal team in the development of recommendations that, when forwarded to APHIS, resulted in the development of new regulations requiring testing of vaccines for R virus. (Exhibit 8a, policy statement issued by APHIS, Veterinary Biologics; Exhibit 8b, statement from National Broiler Council)

"Additional Accomplishments"

Following the selected "Demonstrated Accomplishments," you may list "Additional Accomplishments." Write "Additional Accomplishment" statements in the same format as for other types of accomplishments, and reference them to the publication list when appropriate. **However, exhibits are not permitted for "Additional Accomplishments."** Because the emphasis of RPES evaluation is on quality accomplishments, you should include this section only when you believe the additional accomplishments are equal in importance to those selected as most significant.

B. **Stature, Recognition and Impact**

1. **Honors and Awards**: List with dates and a brief but sufficient description to enable the reader to determine true significance. If a cash award was involved, cite the reason and amount. Differentiate between group and individual awards. Do not include civic or social awards.

Examples:

Member, Phi Kappa Phi
Member, Sigma Xi
USDA Superior Service Award, 1994, $6,000, for _____ (group award)

Elected Fellow, American Society of Agronomy, 1988
Best Paper Award, SSSA, 1993

2. **Special Invitations**: These are to be specific **invitations to you** to present a paper before science-oriented or industry groups, prepare a paper or a chapter for a book, conduct a seminar, etc. These are usually good evidence of professional recognition and standing. The key word is invitation. Be selective since the stature of the group issuing the invitation is just as important as the fact that an invitation was received.

   Scientists in grades GM/GS-13 and above may list as many invitations as they like. However, they **are to select the 20 invitations they consider most significant and indicate these by an asterisk**. If an invitation was declined due to travel restrictions or other reasons, state "Declined" in parentheses after the listing. For each entry, list the title, date, location, and organization or purpose of gathering. If a paper was subsequently published, reference it to the publication list.

   Examples:

   a. Selected as Chairman for Section II of the International Congress of Livestock Production, Lausanne, Switzerland, 1989.

   * b. Invited to present the paper "Metabolism of Organophosphorus Insecticides" at a national meeting of the Entomological Society of America, Miami Beach, FL, 1992 (#22).

   * c. Invited to present the paper "Microencapsulation and Adjuvants" at a symposium "Formulation and Application of Microbial Insecticides" at the national meeting of the Entomological Society of America, Honolulu, HI, 1993.

   * d. Served by invitation on the FAO/WHO Pesticides Residues in Food and the Environment Panel from 1990-92 and 1992-94 (Chair, 1991-93). During these periods, prepared FAO monographs with recommendations on residue limits for numerous pesticides such as Heptachlor, Dieldrin, and Carbaryl. The limits are used by the UN to establish international tolerance, and have had a significantly favorable impact on acceptance of U.S. agricultural exports.

3. **Membership in Professional Societies**: List.

   Examples:

   American Society of Agronomy
   Entomological Society of America
   Southwestern Branch, ESA

4. **Offices and Committee Assignments Held in Professional and Honorary Societies**: List and give dates.

   Examples:

   Member, Board of Directors, Utah Agricultural Chemicals Institute, 1993-Present

Elected Member of Executive Committee (1992-93), Chairman of Nominating Committee (1993-94), and Chairman-Elect of Constitutional Revision Committee (1996), Southwestern Branch, ESA

Chairman, S-01 Technical Committee, (name of committee), 1991

C. **Advisory and Consultant Activities**

1. **Participation in National Scientific Meetings, Technical Conferences, Workshops, etc.**: List, give date, location, type of meeting, and title of talk or paper if one was **given by you**. (Coauthored papers or talks which were presented by others are **not** to be listed.) In some cases, it may be difficult to determine if a paper should be listed here or as an invitational paper. Make this decision and **include the paper in one place but not both**. Reference papers to the publication list. **If you have attended the same meeting, conference, etc., a number of times**, summarize information rather than listing individually.

   Examples:

   a. Attended the ARS-MSA Dung Beetle Workshop and presented the paper "Potential of Dung Beetles for Soil Conditioning," New Orleans, LA, 1992.

   b. Attended the Sunflower Workshop, Bushland, TX, 1993.

   c. Attended four annual meetings of the American Phytopathological Society, 1989-94, and presented the following papers: "Cotton Crops in Texas," San Antonio, TX, 1988 (#10) and "Nematodes Affecting Cotton," Houston, TX, 1992 (also chaired session on nematology).

   d. Attended and participated in the organization and first annual meeting of Regional Project S-102, "An Integrated System for Suppression of the Boll Weevil," 1993-94; also participating member of four separate subcommittees: "Pheromones--Traps," "Evaluation of New Insecticides, Formulations and Attractants," "Direct Growth Regulators," and "Pheromones--Synthesis and Formulation Testing."

2. **Professional Advisory and Consulting Activities**: List each activity with date(s), name and type of organization or situation (generally outside ARS), and type and significance of contribution. These need not be on a "paid" basis. **Service as a journal reviewer is reported under this section**. **If you have numerous entries to report**, summarize information and list only the most recent activities.

   Scientists in grades GM/GS-13 and above may include as many activities as they wish. However, they **are to select the 20 activities they consider most significant and indicate these by an asterisk**.

   Examples:

   * a. Appointed by the Governor of Oklahoma as the ARS representative to the committee on Water Resources Research to advise the Oklahoma Water Resources Research Institute, 1993.

   * b. Consulted with scientists at Federal Technical Institute,

Zurich, Switzerland, on research approaches for study of genetics and manipulation of apomixis, 1989. Incumbent demonstrated cytological techniques for accurate evaluation for mode of reproduction in plants, studied the recent genetic ratios for control of apomixis, and helped arrive at conclusions relative to its inheritance.

c. Incumbent has served on the editorial board of the "Southwestern Entomologist," 1986-present. Responsible for the review and approval of manuscripts relating to research on cotton pests and for maintaining the quality of publications on that area of research.

d. Incumbent has served as a project reviewer for EPA, 1991-present. Responsible for evaluating and making recommendations on proposed research projects that seek funding from that organization.

NOTE: It may be appropriate to cite research-related activities as further evidence of your impact and recognition. Some examples follow:

In cooperation with the National Program Staff, revised and updated USDA Bulletin and Leaflets, e.g., "The Common Liver Fluke in Sheep," and "Preventing and Controlling Internal Parasites of Dogs."

Served as expert advisor at international conferences, committees, and planning sessions. Specifically: (a) advisor on Sheep Parasitic Diseases in the U.S. as the USDA Delegate to the International Office of Epidemiology, Paris, 1987; (b) consultant and advisor to APHIS on planned anaplasmosis and babesiasis vaccination programs in South America. This type of advisory work may involve a few days, a week, one or more times a year.

Served as Chair of a nine-scientist committee to develop and finalize National Research Program No. 20170, 1988-1993. The program writeup provides the basic plans for a 10-year national program in basic plant physiology and biochemistry.

3. **Special Assignments**: These should be of a technical and professional nature. List each; give dates covered and briefly describe. Include formal Technical Advisor appointment activities and contributions to Special Foreign Currency Programs (Public Law 480). Only publications associated with the assignment are to be referenced.

Examples:

a. At the request of AID/FAS and Australia, was sent on special assignment in Australia June 1-November 8, 1993, to consult with and advise U.S. and Australian officials on the identification and control of verticillium wilt.

b. Sponsoring Scientist and Technical Advisor to PL-480 Project IN-SEA-27 to India: "Autecology and Genecological Investigations of the *Cenchrus ciliaris* Complex, Indigenous to India and Growing in America" at Saurashtra University, Rajkot, 1991-present. (Publications #23, #50, #53)

c. Cochair of Southern Regional Forage and Pasture Research Task Force, 1992.

D. **Other**

1. **Educational Background**: List for undergraduate and beyond, the name of each institution and dates attended, majors and minors, and degrees awarded.

   Examples:

   1972-74 Tarleton State College; 24 credit hours in agricultural sciences

   1974-76 Texas Tech Univ.; major, Agriculture; A.A. 1976

   1982-86 Texas A&M Univ.; major, Agronomy; minor, Chemistry; B.S. 1986

   1988-90 Kansas State Univ.; major, Agronomy; minor, Chemistry; Ph.D. 1990

2. **Additional Training**: List all part-time or short-time training not included in Education Background which is **relevant** to the assignment, i.e., scientific or supervisory training. Give dates and duration of course such as credit hours, etc.

   Examples:

   1989 Univ. of Maryland; 27 credit hours in soil science

   1991 Texas Tech Univ.; 8-hour short course on gas chromatographs

   1992 Supervisory Training, Phase I, New Orleans, LA; 40 hours

3. **Research Experience**: List professional jobs held in chronological order giving title, grades, and dates. Include present position.

   Examples:

   1989, Research Associate, Texas A&M Univ., College Station, TX

   1989-90, GS-11, Soil Scientist, USDA, ARS, Tucson, AZ

   1990-92, GS-12, Soil Scientist, USDA, ARS, Tucson, AZ

   1992-93, GS-12, Soil Scientist, USDA, ARS, Temple, TX

   1993-present, GS-13, Soil Scientist, USDA, ARS, Temple, TX

4. **Status**: Cite date of last promotion, or date entered for duty, or "New Hire."

   Examples:

   Last Promotion--July 12, 1991
   or
   New Hire--July 12, 1993

5. **Other Significant Information**:

Present narratively any information **not addressed** in elements A-D considered important in the evaluation of your position. Examples include educational and public relations efforts, and nonresearch activities which may be a part of your responsibilities.

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Any exceptional or extenuating circumstances which may have affected the quality or quantity of research output, either favorably or unfavorably, should be summarized here if such circumstances have not been covered under other items of the format.

This is the appropriate point to summarize past assignments **where recent change in assignment has occurred**. (**Do not** submit copies of former position descriptions as part of the case writeup.)

Materials in preparation or submitted but not yet accepted are to be listed here, **NOT** in the publications list.

Examples:

a. The incumbent is a member of the Graduate Faculty at Texas Tech University, Lubbock, TX, and has served as Committee Chairman for numerous M.S. and Ph.D. candidates.

b. The incumbent's rice quality research program at Beaumont serves as a model system for the establishment of similar laboratories in other countries. He has informally trained and assisted several researchers and technologists from Latin American, Europe, and Asia in rice quality evaluation, in planning and equipping their laboratories, and in programming their work for productive, efficient, and reliable operation.

c. The incumbent is a Registered Professional Engineer (#12340) in the State of Texas.

Often a scientist is required to perform nonresearch duties vital to ARS operations. When classifying a research position having mixed duties, direct credit cannot be given for nonresearch activities such as some Location Coordinator duties, Equal Employment Opportunity Counselor, Safety Officer, etc. A brief description of the intended role in meeting organization goals and objectives, how well this role is fulfilled, and how effective the individual is in cooperating with others when this is necessary or desirable in the total program, can be indicated.

Panels may determine that an incumbent's research progress is being slowed because of excessive nonresearch activities. Panels should call such situations to the attention of management in the panel report or in a separate memorandum to the supervisor. Management can then take action by assigning the activities to someone else, providing necessary support assistance, discontinuing the activities, or other feasible means. In some situations it is necessary to reassign an incumbent to a nonresearch position and classify the position accordingly.

NOTE: Continuing nonresearch activities which take 25 percent or more of your duty time should be reported in Factor I. Such activities will be evaluated using the "mixed position" concept by reference to other position classification standards and guides.

E. **Publications**

Start this segment on a separate page. Attach the entire listing at the end of the case writeup. With regard to scientific journal articles, **list only those already published or accepted by the publishing agent**, citing acceptance date for the latter.

Other publications to be listed are patents, review articles, technical bulletins, books, book chapters, conference or society proceedings, technical research reports (written reports which require clearance for public release), thesis/dissertation, popular publications, and others (identify specifically; for example, transcript of radio talk). **Do not include** talks, radio or other **presentations unless they have actually been published**.

List publications in chronological order, all authors in proper order. Give full references including journal, volume and complete pagination. **Delineate by a dashed line across the page those materials published or accepted for publication since last promotion.**

To avoid confusion, assure that titles in the publications list conform with ***actual*** titles as published.

NOTE: Materials in preparation or submitted but not yet accepted are to be shown in section IV D 5, Other Significant Information, ***NOT*** as part of the publications list.

Examples:

1. Jones, J. H. Soil and wind erosion in West Texas. Tex. Tech Univ. 94 pp. 1989. (Thesis)

2. Emerson, H. B. and Jones, J. H. Observations of *Eimeria mohavensis* from the kangaroo rat. J. Parasitol. 36 (59):117-124. 1989.

3. Jones, J. H. and Eliot, T. S. Inheritance and control of obligate apomixis in breeding buffelgrass, *Pennisetum ciliare*. Crop Sci. 6 (2):473-476. 1990.

4. Jones, J. H. Narrow rows increase dryland grain sorghum yields.

Tex. Agric. Exp. Stn. Misc. Publ. #1238. 2 pp. 1990. (Technical Bulletin)

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5. Jones, J. H. Cotton Crops of Texas, pp. 78-94. In Brown, D. F. and Black, J. R. (eds.) Cotton of the South, Simplex Publ. Co., New York. 328 pp. 1991. (Book Chapter)

6. Jones, J. H. Rabbit feeding on demand. (Accepted by Rabbit Growers' J. on Nov. 17, 1992.) (Popular Publication)

7. Jones, J. H. Systems for rearing horn flies. ASAE Paper #89-1200. 10 pp. 1993.

8. Jones, J. H. Coccidiosis in the pocket gopher. J. Wildlife Biol. 7 (12): 918-20. 1994.

431.3

Abstracts may be listed at your option. If you choose to include them, they are to be in an unlettered section **on a separate page at the end of the publication list**. List abstracts in straight chronological order and number them sequentially (preceded by an "A"), **without a line delineating** those published or accepted since your last promotion. An example follows:

Abstracts

A1. Jones, J. H. Studies on coccidiosis in the pocket gopher. Proc. Am. Soc. Protozool. p. 16. 1992.

A2. Howard, O. O. and Jones, J. H. Controlling obligate apomixis in breeding buffelgrass. Proc. XII Intl. Range Sci. Cong. (accepted 6/95).

Do not cross-reference abstracts to the Publications list. If you submit an abstract as an exhibit for a Demonstrated Accomplishment, cite it in the following manner: "Exhibit 5a, #10; Exhibit 5b, #27; Exhibit 5c, Abst. #A3."

NOTE: Per the Administrator's direction, mail a separate copy of the publications list directly to the Indexing Branch, National Agricultural Library, Beltsville, MD 20705, when you submit your case writeup.

Subchapter 5 - Case Writeup Submission Checklist

1. Prepare and attach ARS-514 (Exhibit 1) to serve as a transmittal and certification sheet.

   a. Enter scientist's name, title, **present** series and grade, working title such as Research Leader (if any), research unit, duty station, immediate supervisor's name and working title, peer group (**use only current alpha code** shown in Directive 431.3, Exhibit 1), and date case writeup is prepared.

   b. Employee, immediate supervisor and Area Director sign the form; intermediate supervisor(s) may initial.

2. Prepare and attach ARS-570 (Exhibit 2). Designate (by number) which accomplishment(s) from Factor IV-A each contact is knowledgeable about. If the contact is a general (multi-accomplishment or career-long) contact, enter the word "General" rather than accomplishment number(s). ***Be sure to include your immediate supervisor.*** It is recommended that--where possible--a wide variety of contacts be listed, and that contacts **not** be restricted to ARS personnel. Possible selections are National Program Staff scientists, Area Directors, Location Coordinators, Technology Transfer Coordinators, cooperating scientists, etc. At least some persons from USDA and other action agencies, State agencies, user groups, academia, and others outside of ARS, should be listed.

3. To meet record and panel distribution requirements, case writeup packages are to be assembled and submitted to the RPE Staff. A case writeup package consists of an AD-332 certified (signed and dated) by the immediate supervisor, a certified ARS-514, an ARS-570, Factor I-IV writeup, and exhibits. The following requirements are established:

   a. **Master Package**. The certified AD-332, certified original ARS-514, original ARS-570, and original Factor I-IV writeup--assembled in that order. (**Exhibits are not included** in the master package.)

   b. **Distribution Packages**. Submit seven (7) copies of the ARS-514, ARS-570, Factor I-IV writeup, and exhibits--assembled in that order. (**AD-332's are not included** in the distribution packages.)

CAUTION

DO NOT edge-bind case writeups or exhibits.

DO staple all pages of the writeup and each exhibit, to assure pages are not lost.

EXHIBITS

Exhibit 1 - ARS Form 514

<table>
<tr><td rowspan="3">Research Position Evaluation Case Writeup (Cover Sheet)</td><td>Name of Emplyee</td><td>Date</td></tr>
<tr><td>Title</td><td>Series and Grade</td></tr>
<tr><td>Organization</td><td>Peer Group (Alpha Code)</td></tr>
<tr><td>Supervisor</td><td colspan="2">Title</td></tr>
</table>

Privacy Act Notification

General

This information is provided pursuant to the Privacy Act for individuals supplying information for inclusion in a system of records. Section 5107, Title 5, United States Code, authorizes agencies to place positions in the appropriate grade and series in conformance with standards published by the Office of Personnel Management (OPM). The Research Grade- Evaluation Guide (RGEG) published by OPM in accordance with Section 5105, Title 5, provides guidance/criteria for evaluation of research positions. Providing information for Factor IV is voluntary, but essential to the classification process.

Purposes and Uses

Factor IV collects information needed to provide a Research Position Evaluation Panel with essential incumbent facts to evaluate the position against RGEG criteria. This information may be disclosed to appropriate officials/employees of the Agricultural Research Service (ARS), USDA Office of Personnel, and OPM, involved in the research position classification process. This data may also be used to aid decisions on placement of research scientists within ARS.

Effects of Nondisclosure

Because Factor IV of the case writeup contains information which the panel uses to classify your position, providing complete and specific information for each element of the factor is in your best interest. Omission of an item may result in a lower score than otherwise appropriate.

))
Employee's Signature **Date**

CLEARANCE

I have reviewed this case writeup and find it to be accurate, complete and in the prescribe format. A properly signed and dated AD-332 is included.

))
Supervisor's Signature **Date**

))
Area Director's Signature **Date**

Form ARS-514 (10/95) **Local**

Reproduction

Exhibit 2 - ARS Form 570

INDEPTH REVIEWER CONTACT LIST

Name of Scientist _____

Contact's Name, Official Capacity and Location	Telephone Number(s)	Knowledge of Accomplishment(s) Number:

ARS Form 570 (12/95) **Local Reproduction**

Chapter 2, Guidance for Panelists

This chapter provides detailed procedures and evaluation tools which panelists need to know in order to serve effectively on mandatory and ad hoc panels. Addressed are (a) panel procedures (including report preparation), (b) IDR guidelines, (c) the OPM RGEG, (d) guidelines for applying the ARS Accomplishment Rating Guide, and (e) additional guidance on interpreting the RGEG and crediting patents.

Subchapter 1 - Panel Operating Procedures

A. **Prior to the Meeting**:

1. Panelists will be provided with a copy of each case writeup (with exhibits) to be reviewed, and an ARS-516 (Research Position Evaluation Worksheet) on a disk to copy locally as needed. The IDR will prepare an ARS-516 for each case assigned by the panel Chair. Panelists other than the IDR may use the ARS-516 for initial scoring and to note questions and comments for clarification during panel deliberation.

2. Chair makes indepth review assignment(s) to individual panelists, within 1 week of receipt of case packages.

3. Designated IDR's schedule timely contacts with the people they intend to interview (see Subchapter 2).

4. All panelists review, evaluate and score each case in accordance with criteria of the RGEG (Subchapter 3) and the ARS Accomplishment Rating Guide (Subchapter 4), using the following approach:

   a. Begin scoring with Factor IV, which is the most important factor in the RGEG. For each of the three to eight significant accomplishments submitted by the scientist, review the statement **and** the exhibits (publications or other documentation) accompanying the case. Then use the ARS Accomplishment Rating Guide to (1) determine the most appropriate *type* of accomplishment (Knowledge Development, Knowledge Application, Literature Review, Methods Development or Leadership/Special Assignment); (2) decide the relative quality level for each (Acceptable, Important, Superior or Outstanding); (3) and select the highest-rated accomplishments (maximum of three) representing the incumbent's "best work."

      Consider incumbent's role in each Demonstrated Accomplishment when judging the appropriate overall degree level. Sound judgment must be used in deciding the degree level most representative of the total quality, significance and role of the incumbent in the accomplishments.

      Evaluate Factor IV using RGEG criteria. Compare the position/incumbent facts to the RGEG, determine which degree best characterizes the facts, and record the degree level on the ARS-516. Use "+" or "-" if you desire to show ratings between degrees, which are to be adjusted

following panel discussion.

The case should be examined carefully to determine if documented **evidence of recency** is sufficient to give full credit for Factor IV. If a lack of recent documented accomplishments has apparently jeopardized maintenance of research competence, **reduce the degree level assigned for Factor IV**, and mark the appropriate block on the ARS-516.

Recency of accomplishment is important. The RGEG states that "recent research or similar activity which assures maintenance of research competence is essential for full credit of past accomplishments." If there is no documented evidence of recent productivity, the possibility exists that the position is not performing research and is therefore excluded from RGEG coverage (perhaps warranting a GNA decision). Another possibility is that the incumbent has failed to maintain the level of contribution and impact necessary to sustain the position's current grade level (perhaps warranting an SBG decision).

For RPES purposes, **"recent" is defined as the interval since the last panel evaluation**.

b. Evaluate the remaining three factors (I-III) by reference to the RGEG, using the general approach discussed above. **In scoring Factors I-III, you must carefully consider the interaction of Factor IV with these factors**. This is particularly true if a research assignment is described in Factor I but there is no evidence that the incumbent is actually performing research. Such situations should be investigated for possible GNA decision.

c. For each of the four factors, decide the overall degree level to assign to the factors, assign corresponding points for the degree levels as shown in the RGEG, and record the points on the ARS-516. If there is great variation among the degree levels assigned for the factors, carefully review RGEG criteria and identify significant issues for resolution during panel deliberation. Ideally, there should be a positive correlation between the degrees assigned to the factors.

d. **When scoring cases, panelists must bear in mind a basic classification principle: the full intent of RGEG degree criteria must be substantially met to warrant credit at the defined degree levels (A/C/E/In Excess of E)**. If criteria of the defined levels are not fully met, assignment of the undefined Degrees B and D is appropriate.

5. **Instructions for Preparation of ARS-516 by IDR**.

a. Copy the desired version ("FIRST.516" provided in WordPerfect 5.1, 12 cpi format; "SECOND.516" provided in ASCII text format) of the ARS-516 from the disk distributed with meeting materials onto your personal computer for permanent retention and use.

NOTE: Take the disk to the panel meeting and give it to the Personnel Representative, who will return it to the RPE Staff for reissuance.

A paper copy of the ARS-516 is also provided for those who prefer to use it, and as a reference to verify the content of the version

captured on the personal computer.

b. On your personal computer, make and complete a separate ARS-516 for each case for which you have been assigned IDR responsibility. (**DO NOT COPY COMPLETED ARS-516's BACK TO THE DISC!**)

c. For each factor, the ARS-516 provides a standardized format for recording position/incumbent facts gleaned from the case writeup and your IDR factfinding. Use the blank spaces and boxes as guides to assure that you capture all relevant information during your factfinding, and to facilitate report preparation.

d. The completed ARS-516 constitutes a "first draft" of the panel report. After reaching a consensus RIG or SBG decision, the panel will edit the ARS-516 to produce a detailed narrative position evaluation report. (See B 10 c below for procedure when the panel reaches a consensus PRO or REF decision.)

e. To simplify the panel's editing task, **complete the ARS-516 in whole sentences**. The ARS-516 is purposely formatted to assure collection of information essential to the classification process. Note that **it is neither necessary nor desirable** to generate lengthy, detailed statements when preparing the ARS-516. Simply complete the worksheet **within established space limits** with concise, factual information. Do not "fill every inch of space" on the worksheet--doing so will unnecessarily lengthen the draft report and require additional panel time to edit out extraneous text.

f. For Factor IV, (1) rate each Demonstrated Accomplishment as described above, (2) select the most significant (maximum of three), and (3) summarize the significance/impact of these highest-rated accomplishments and explain incumbent's role in each, in brief sentences. Also, be sure to identify situations where recency of accomplishment or diminished stature/recognition/consultation may be a problem.

g. Some information requested under each factor is intended to "prompt" capture of critical information. Complete each entry, even though some information from the entries may prove marginal or irrelevant and may be deleted when editing the worksheet to produce the final report. For example, if recency of accomplishment (Factor IV) is **not** a concern, this statement would obviously **not** be included in the final report. Where **it is** a concern, the "prompt" statement applies. You must summarize information relevant to the "prompt" on the ARS-516.

h. At the bottom of each page, compose a brief (one-sentence) factor rationale summary for each factor stating why a given degree has been assigned. This sentence must be phrased **in relation to RGEG criteria** for the appropriate degree level. **Two sentences will be required to summarize a Degree B or D rating**. Sample statements, illustrating intent, are listed below. You are to use these samples as models to tailor the facts of the specific position to the factor rationale summary sentence.

Note: Statements relevant to Degrees B/D are shown where appropriate in the samples. If the IDR neglects to include Degree B/D statements in the draft summary sentence (or if the panel reaches consensus on such degrees and the IDR had different degrees assigned initially), the Personnel Representative must assure that the panel agrees with the terminology when either Degree B or D is the consensus decision for a given factor.

Factor I

The panel assigned Degree B because Dr. _____ is responsible for all phases of an area of research, objectives are considered hard to define, and conventional methodology is required. This exceeds Degree A criteria but falls short of Degree C.

The panel assigned Degree C because Dr. _____ is responsible for an area of research requiring a systematic attack, sophisticated as well as standard methods of plant pathology are followed, and successful research will result in a series of documentable additions to knowledge of considerable interest to the scientific community.

The panel assigned Degree D because Dr. _____ is responsible for leading a team of scientists in conducting exceptionally difficult research, existing techniques must be modified before substantial progress can be made, and the research is expected to provide significant benefits that will result in documentable modifications of existing theories. This exceeds Degree C and approaches but does not fully meet Degree E, so Degree D is appropriate.

The panel assigned Degree E because Dr. _____ is responsible for leading a team of scientists and is independently conducting exceptionally difficult research on critical problems, existing hypotheses and techniques need to be significantly extended before substantial progress can be made, and significant documentable information on dietary and physiological factors controlling mineral absorption and use are expected.

Factor II

The panel assigned Degree B because Dr. _____ has substantial freedom to select specific problems and decide approach and execution within a defined area. This exceeds Degree A criteria but Degree C would be excessive, so Degree B is credited.

The panel assigned Degree C because Dr. _____ has considerable freedom in problem selection and in planning and conducting the research, only the overall results are reviewed, and approval is only required for major changes in the research.

The panel assigned Degree D because the area is broad and complex, research approach is decided by Dr. _____, very little technical guidance is received, and execution of work and interpretation of results are his responsibility. Results are accepted, subject to validation by the scientific community, and only broad changes in direction of work require supervisor's approval. This exceeds Degree C but falls short of Degree E criteria.

The panel assigned Degree E because a broad area is assigned and general research approach is decided by Dr. _____, supervision is primarily consultative due to her high level of technical expertise, technical judgments and interpretations are considered authoritative, and she is under general supervision with full responsibility for

formulating and executing the research.

Factor III

The panel assigned Degree B because there is useful literature available but it requires new application to the areas researched, originality is required in defining problems and in the application of new combinations of physical techniques required to resolve the presence of thionitrites in protein-containing materials, and Dr._____ 's work has shown her ability to isolate critical aspects of problems and to adapt existing principles into new combinations. Degree A is exceeded but not sufficiently to warrant Degree C.

The panel assigned Degree C because literature is considered lacking for significant portions of the research and a high degree of originality is required (particularly in defining problems and developing hypotheses), and the panel judged that Dr. _____'s past work reflects the ability to adapt existing principles into new combinations.

The panel assigned Degree D because relevant literature on polyploid quantitative genetics is limited, originality is required in the study of new areas and interpreting results, and Dr. _____ has demonstrated originality by application of statistical techniques to problems in quantitative genetics of autotetraploids which have significantly modified existing technology. This exceeds Degree C but falls short of Degree E criteria.

The panel assigned Degree E because, although there is existing literature and methodology, it is lacking for major portions of the research, creative extension of existing theory and/or methodology is necessary, and Dr. _____ has extended her chemical findings to classification of viruses which represents a creative extension of existing theory and methodology.

Factor IV

The panel assigned Degree B because Dr. _____ has authored technical publications at least one of which is of considerable importance to the assigned research situation, his work is beginning to be recognized as evidenced by recent invitation to present his work in a poster session at the American Chemical Society, and he shares his expertise in *Rhizobium* genetics with others. Degree A is somewhat exceeded, but not sufficiently to warrant Degree C.

The panel assigned Degree C because some of Dr. _____'s accomplishments have been of considerable interest to science/ technology, she has demonstrated her ability as a mature, competent productive worker, and she deals responsibly with others in the area of seed pathology, serves on several technical committees and is sought for consultation.

The panel assigned Degree D because Dr. _____ has developed products (varieties) which have had a major impact on usage in the U.S. and abroad, he has received several prestigious awards, and he is recognized as an expert in the field and has been in leadership roles in the International _____ Society. Degree C criteria are exceeded but Degree E credit would be excessive.

The panel assigned Degree E because the accomplishments have had a significant impact on the field of nematology, Dr. _____ has demonstrated outstanding stature and received significant recognition in nematology and has made important contributions to that field, and he is constantly being sought for consultant purposes in this area of expertise and has contributed significantly to several professional societies.

i. Other considerations to bear in mind when preparing an ARS-516 are:

(1) Do not report that a certain score was assigned but "points were deducted for lack of recency." The consensus decision will be at the lower degree, and the panel will never have actually assigned the higher score.

(2) Maximum points creditable by a regular panel when scoring a case "In Excess of Degree E" are 12 points for Factors I-III, and 24 points for Factor IV. (It is, however, rare for a GM/S-15 position to warrant "In Excess of Degree E" for all four factors.) Also, because splitting Factor IV is not permitted, 22 points cannot be assigned for "In Excess of Degree E."

(3) Reports should contain only remarks pertinent to the current classification decision. It is especially important to avoid nonbinding comments which could lead to false expectations.

(4) "General Comments" are to be used only (a) to document borderline scores (see B [7] below), and (b) when necessary to document emerging deficiencies requiring correction to preclude future evaluation difficulties. For the latter, use a variation of one of the following statements, or a comparable statement, tailored to the incumbent's specific circumstances:

- "The panel is concerned about the dearth of senior-authored publications in refereed journals [or other evidence of independent research or research-related activity.]"
- "Minimal participation in scientific meetings is severely limiting incumbent's stature and recognition."
- "Incumbent's nonresearch activities--specifically, _____ --appear to be interfering with research productivity."

j. To facilitate reporting of initial scores, transfer initial factor/total points to the space provided at the top of page 1 of the worksheet.

k. The IDR must bring (1) 7 paper copies of each completed ARS-516 (**TYPED SINGLE-SPACE**), and (2) 1 copy on overhead projector transparency (plastic) sheets to facilitate discussion and editing during the panel meeting.

B. **During the Meeting**:

During panel meetings, the RGEG is used to help identify points of disagreement among panelists and focus discussion on such points. The procedural sequence for each case is as follows:

1. The meeting opens with a review of procedures by the Chair and Personnel Representative. The Chair stresses the necessity of maintaining confidentiality of deliberations.

2. Consideration of each case begins with the panelists each reporting the 1-3 highest-rated accomplishments and initial factor scores. These data are recorded by the Personnel Representative on an overhead projector transparency of the Research Evaluation Score Sheet (ARS-517).

3. The Chair identifies points of difference among panelists. Significant differences among initial scores will indicate where discussion should be focused.

4. The IDR then distributes the completed ARS-516 and presents to the panel a summary of the major points from the factfinding process, to include:

   a. Rationale for degree values initially assigned to each factor.

   b. Observations (if any) on writeup content, weaknesses, and other relevant considerations. These views are strictly advisory information to the panel.

   c. Major discrepancies (if any) between the case writeup and actual position/incumbent facts which must be corrected. The case writeup must support the panel's consensus decision.

      NOTE: If after discussion, the panel determines that such discrepancies cannot be resolved, and that failure to resolve them would prevent a fair evaluation, an IFB decision is appropriate.

5. General panel discussion follows the IDR report. Specific questions may be directed to the IDR or other panelists to obtain additional or clarifying information. IDR's are encouraged to bring their notes from contact discussions to the meeting to facilitate answering questions.

6. The Chair then leads a factor-by-factor discussion and evaluation of the case, usually beginning with Factor IV and proceeding to Factors I, II and III. The panel reaches unanimous agreement (consensus) on each factor and overall decision, except when review results in a Split Decision (see B 8 c below).

7. If the initial panel consensus results in a ***borderline score*** (see Directive 431.3, Section N 3), the Chair will lead a discussion to determine whether the position has any significant strengthening or weakening aspects not previously considered. If strengthening aspects **are** found, the initial consensus score will be adjusted upward by the appropriate number of additional points, thus eliminating the initial borderline score and the necessity for further borderline documentation. If strengthening aspects **are not** found, one of the following standard documentation statements will appear in a General Comment:

a. **For RIG decisions**: "The above evaluation yields a total of ___ points, a borderline score. During the course of its deliberations, the panel found no strengthening aspects sufficient to warrant promotion to the next higher grade. Based on application of the RGEG, and in line with other properly classified positions, this position is appropriately evaluated at grade __."

b. **For SBG decisions**: "The above evaluation yields a total of ___ points, a borderline score. During the course of its deliberations, the panel found no strengthening aspects which would serve to offset identified weaknesses. Based on application of the RGEG, and in line with other properly classified positions, this position is appropriately evaluated at grade __."

8. When the panel cannot reach consensus within a reasonable time:

   a. The case may be "tabled" and brought up again later after other cases have been decided. If appropriate, additional clarifying information will be sought by telephone during the intervening period. "Tabled" cases must either be decided by the conclusion of the meeting or resolved as discussed under (b) or (c) below.

   b. The case may be returned for revision and submission to another panel if additional information/clarification is needed before a decision can be reached (an IFB decision). **The panel report must specify the needed information/clarification**.

   c. If consensus cannot be reached, a Split Decision is recorded. The panel divides into majority/minority groups. The majority finalizes its version of the panel report in the usual manner (see [10] below). The factor or factors in dispute are identified, and the minority drafts its version of those factors to reflect its view. **Both majority and minority reports must be finalized before the meeting adjourns** and given to the Personnel Representative. Within 2-3 weeks of the panel meeting, the Personnel Representative has both reports typed final and forwards them (along with one complete copy of the case writeup and exhibits) to the RPE Staff. The Staff transmits the package to the Associate Administrator for resolution. The Associate Administrator will render a final decision (from among the authorized options) within approximately 6 weeks of receipt.

9. Panelists are not authorized to keep copies of any case materials (except exhibits) on positions they review. Case materials, all initial scoring data and related notes (including IDR factfinding notes) will be disposed of at the conclusion of the panel meeting.

10. Producing the final report is an essential step in the panel process. The IDR's statements--as recorded on the ARS-516--are edited as necessary to reflect the views of the panel as a whole, with any agreed-upon changes being recorded on the transparency by the Personnel Representative.

NOTE: The final report is to be a "full-panel" product, and is not to be "left to the Personnel Representative" to complete.

a. The panel report serves several purposes:

- To document the results of the position classification review for official personnel purposes.
- To provide classification feedback to the incumbent. It should be noted that panels cannot make statements binding on future panel decisions, so reports will not explain what a scientist "needs to do to get promoted." Reports will, however, identify grade-threatening deficiencies which should be addressed before the next cyclic review.
- To alert management to potential problems and provide management an additional measure of progress of the incumbent's research program.

b. Classifying a position using the "person-in-the-job concept" requires judging the incumbent's research career. This process touches on the incumbent's professionalism, judgment, capabilities, motivation and accomplishments in relation to the research assignment. The process is thus a highly personal matter to the incumbent. Those preparing the panel report must be sensitive to the probable difficulty of the incumbent--and to a lesser extent, of supervisor(s)--in being objective about the evaluation. The report must therefore be factual and carefully worded. When shortcomings or suggestions from a classification point of view are made, they must be clearly and concisely stated. Highly subjective, personal or controversial information has no place in the report.

c. To provide additional time for panel deliberation on other cases under review, two types of decisions do not require preparation of panel reports:

(1) **For PRO decisions**: Panel will not edit the ARS-516. The Personnel Representative will note the consensus scores (and any remarks the panel believes appropriate) and transfer these to the Research Position Evaluation Report (ARS-518). The ARS-516 will be discarded.

(2) **For REF decisions**: ARS-518's are not issued when a "regular" panel reviewing a GM/S-15 position reaches a REF decision, i.e., assigns 54 or more points. The ARS-516 will be discarded, the Personnel Representative will simply note that a consensus REF decision was reached, and the appropriate AD will be notified by the RPE Staff. The Staff will also issue notices to referred scientists to prepare their cases for submission to the Supergrade Panel. (Supergrade Panels will issue both ARS-518's and narrative reports for each position reviewed.)

Panelists Note: The above procedures regarding PRO and REF decisions only affect action **after a panel reaches such consensus decisions**. The IDR must complete an ARS-516 for each position assigned to them, regardless of how they initially score the case. An IDR's failure to prepare an ARS-516 does not relieve the panel of its responsibility to generate a report when a

consensus decision other than PRO or REF is reached.

11. Panels are authorized to write memoranda (separate from the panel report) to supervisors and managers expressing concern over perceived long-standing or emerging worksite problems. However, panels are not research managers, and neither the panel report nor any separate memorandum should infringe on management responsibilities and authority.

C. **After the Meeting**:

1. **Panel Ratings**. Chairs rate panelist performance, and panelists rate panel operation, on forms provided by and returned directly to the RPE Staff. These ratings relate strictly to panel performance and, except for Personnel Representatives, are **not** considered in the employee's annual performance appraisal. The evaluations are intended to assist in identifying training needs, and in determining the acceptability of panelists and Chairs for continued panel service.

2. **Final Panel Report**.

   a. For decisions other than PRO and REF, the Personnel Representative will incorporate panel-edited reports into the standard narrative report format, have the reports typed in final form, attach to completed ARS-518's, and issue to the scientist's immediate supervisor through the appropriate Area Director.

   b. For PRO and REF decisions, the Personnel Representative will follow procedures explained in B 10 c above.

   c. The supervisor is required to provide a copy of the panel report to the scientist. The scientist acknowledges receipt by signing the bottom of the ARS-518, and returns the original through supervisory channels to the Area Director **within 60 calendar days of issuance**. The Area Director returns the report to RPE Staff to be maintained in the researcher's folder.

   d. All questions regarding panel decisions and determinations must be referred to the Personnel Representative.

D. **Ad Hoc Panels**:

Ad hoc panels are usually convened to determine--using RGEG criteria--the final grade level of Category 1 vacancies being filled by selectees from various sources, generically referred to as New Hires. New Hire panels are required for all selections at and above GM/S-13, and may also be convened in other situations (see Section K and Exhibit 3 of Directive 431.3). Ad hoc panels may occasionally be convened to handle other noncyclic review situations.

There are a few minor differences between ad hoc and regular panels: ad hoc panels usually review only one position; only five (rather than seven) panelists are required; and, ad hoc panels are conducted via teleconference call. A procedural summary follows:

1. RPE Staff schedules a teleconference call, using either USDA or AT&T services.

2. RPE Staff sends a memorandum with panel arrangements, case materials, ARS-516, and ARS-517 to panelists at least 10 calendar days before the scheduled meeting date. (Scoresheets are provided for panelist convenience in recording other panelists' scores as they are reported.)

3. RPE Staff selects the IDR using information from the Panelist Data Verification form completed by each peer scientist. IDR's follow normal factfinding procedures, including preparation of the ARS-516. To facilitate

timely issuance of the panel report, the IDR must provide a copy of the completed ARS-516 to the Personnel Representative prior to the teleconference call.

4. As with a regular panel, all panelists and the Chair must evaluate the case, with particular attention to the research accomplishments. Panelists other than the IDR may use the ARS-516 for initial scoring and to note questions and comments for clarification during panel deliberation.

5. The panel applies standard RPES policy and procedures in evaluating the position. Once the panel reaches consensus on factor points and overall score, the IDR will read the ARS-516 to assure panel concurrence. The Personnel Representative notes any consensus changes, and prepares and issues the report and ARS-518 in the usual manner.

Your primary responsibility as an Indepth Reviewer (IDR) is (1) to be able to clarify for other panelists information that is in written case materials, and/or (2) to provide information that is lacking in the written material but which is required for a panel to make an equitable classification decision. This information will relate primarily to the scientist's accomplishments, the impact of those accomplishments, and the scientist's stature in his or her field.

As an IDR, you are to be a factfinder and an investigator, but especially a confirmer of facts and their significance as claimed by the incumbent. You must avoid becoming either the "advocate" or the "prosecutor" of the scientist whose case you are reviewing. Serving as IDR is the single most important role you will have as a panelist. The quality of your factfinding has a direct impact on the quality of the panel decision, and therefore on the scientist's career.

Here are some pointers which will help you do a good job:

A. Get familiar with the criteria relevant to classifying Category 1 positions. These are presented in the Research Grade-Evaluation Guide (RGEG) and in this Manual.

B. Understanding what information to *expect* in a writeup is best learned by examining Chapter 1 of Manual 431.3, which explains both format and content requirements. If a writeup answers all topics called for in Chapter 1, the IDR's task becomes the simpler one of verifying the information. If all topics are not addressed in the writeup, the IDR has the additional task of finding that information so the panel will have fullest possible knowledge about the position/incumbent facts.

C. In conducting factfinding interviews, focus on unanswered or unclear writeup discussion of topics from Chapter 1. Also take advantage of people's inherent tendency to like to talk. A contact will frequently give you valuable information or perspectives if you just give the contact the opportunity to respond to general questions about the incumbent, i.e., "How would you rate Dr. Jones on a scale of 1 to 10?" Do not ask what grade level the contact believes the scientist should be. In situations where an accomplishment was achieved via team research, it is especially crucial to pin down the incumbent's relative contribution to the overall team achievement. This may also be important when there is a question about the roles of multiple authors of a paper.

D. Agency policy requires that IDR's contact a minimum of five individuals, one of whom *MUST* be the immediate supervisor of the position under review. There is no maximum number of additional contacts. Use common sense; a few contacts might be adequate for a relatively straightforward case at the lower grades, but would almost certainly be totally inadequate when evaluating a more complex, higher-graded position. Seldom, however, will an IDR need to make more than 8-10 contacts. As IDR, you are authorized to contact anyone you believe can provide needed information. You are not restricted to names listed by the scientist on the ARS-570. Many IDR's have obtained the best results by following leads outside the contact sheet, for example previous supervisor(s), coauthors, past or present coworkers, and others familiar with the research area such as National

Program Leaders, or industry and university cooperators. Are you authorized to contact the *incumbent*? Yes, you may, but we recommend you do not. Most experienced panelists feel the negatives here far outweigh the positives. When should you stop factfinding? When you feel you have enough information to answer all questions the panel is likely to pose.

E. Ideally, but not always, primary review responsibility will be assigned to a panelist who has competency in the discipline area of the case. However, objectivity is more critical than specific discipline knowledge. This is an important concept. Your job is to ***get*** the necessary information, not necessarily to ***be*** the original source of information. Many scientists complain that "the IDR didn't know anything about my field." This implies that only "true peers" can make valid judgments. But as experienced panelists and Chairs will be quick to point out, "true peers" often have the most difficulty in being objective, and may be more reluctant to follow up (and report) leads which do not agree with their personal views. Bear in mind: objectivity **is** more critical than specific discipline knowledge when it comes to doing a quality indepth review.

F. Remember that the task is to seek information in an **unbiased** manner. Resist the temptation to reveal personal opinions or evaluations of the case. What matters in the RPES is the panel's **consensus** decision. ***Do not*** ask questions such as, "Should this person be promoted?" "Is he/she doing a GS-14 job?" "How does he/she get along with his/her coworkers?" If people you are interviewing volunteer such information, ignore it and above all do **not** report it to the panel! IDR's are certainly in the position of having to exercise discretion, good judgment, and common sense in reporting their observations to the full panel. **Do not** reveal to contacts your tentative classification decision: the panel may very well disagree and the final (consensus) may be very different.

NOTE: It is recommended that IDR's assure persons contacted that the information they provide will be held in confidence by the panel. IDR's should also request, in turn, that the contact maintain confidentiality concerning the IDR's identity.

G. Do not call a supervisor and immediately say, "Hi! I'm the IDR on Joe's case. I need as much help as I can get on this case, because this stuff is way out of my field." Saying this sets the stage for a potentially disastrous interview and a lingering doubt as to the quality of the entire panel review. Remember that you are performing a perfectly legitimate, essential factfinding and fact confirming function. There is no need to be apologetic either for intruding on someone's time or for not being a subject matter expert. You need not be performing the same or even closely-related research in order to perform an effective indepth review.

H. Begin your factfinding as soon as possible after the Chair assigns your indepth reviews. Do not put yourself in the position of missing vital information because the person you needed to talk to "just left the country and won't be back for 2 weeks"!

I. If you run into problems, let your Chair know. The Chair is an experienced panelist and may be able to suggest useful actions to resolve the problem. Since the Chair is ultimately responsible for the panel operation, he or she has a natural interest in overcoming obstacles to panel success.

J. Contact the Personnel Representative serving on the panel if you have policy or procedural questions. Answering these questions is one of their principal roles on the panel. If you discover information which indicates the scientist may be a

"poor performer" subject to formal performance improvement, be sure to notify the Personnel Representative immediately. The Personnel Representative will check this information with the servicing Employee Relations Specialist in the Human Resources Division.

K. The final step in conducting a first-class indepth review is to bring a solid draft panel report to the meeting. Details about completing the Research Position Evaluation Worksheet (ARS-516) are provided in Subchapter 1 of this chapter. The main points here are to (1) keep the fact statements and rationales concise and responsive to factor criteria, and (2) remember to include the required summary statements for each factor (including those scored at either Degree B or Degree D). Just remember that the better the draft you bring to the meeting, the quicker and less painfully the panel can edit the final report and finish its job.

NOTE: If you are not the IDR on a given case, we recommend that you **not** make any factfinding contacts. Contacts from several persons on a panel can be confusing and irritating to supervisors and other contacts. If you have unresolved questions after initial scoring, either refer them to the designated IDR for investigation or record "+" or "-" scores and adjust during the panel meeting based on the IDR report and subsequent discussion.

A parting thought: It is no secret that service as an IDR is ***the most critical role*** in the entire RPES process. Doing a good job as an IDR is not difficult, but it is admittedly a bit time-consuming and requires organization, perception, good judgment, wisdom and--above all--common sense. Your dedication and good work as an IDR are absolutely essential in ensuring that the system works accurately and fairly, and that it is perceived to be such by ARS scientists.

RESEARCH GRADE-EVALUATION GUIDE

Contents

(TS 52)
June 1964

This is a verbatim reprint of the OPM RGEG (TS-52, June 1964, as revised by TS-23, January 1976). As an official Government position classification standard, the RGEG is not subject to revision by ARS. Use of the terms "he" and "his" is generic.

Pages 2, 21 and 30 were left blank in either the original or revised standard, and are therefore not found in this reprint. TS-23 also changed footnote 1 and eliminated footnote 2, without renumbering the other footnotes.

The "Guide for Appraisal of Scientific Positions Proposed for GS-16, GS-17, and GS-18" cited herein was rescinded by (TS-105, June 1991). The "Supervisory Grade-Evaluation Guide" cited herein was replaced by the "General Schedule Supervisory Guide" (TS-123, April 1993).

RESEARCH GRADE-EVALUATION GUIDE[1]

Introduction

This grade-evaluation guide is intended for use across series lines in determining grade levels of research positions. It supersedes the Guide for Evaluation of Positions in Basic and Applied Research issued in June 1960 and the Appendix-Frame of Reference Illustrations issued in August 1960. The basic concepts and structure of the 1960 guide are essentially unchanged. This revision is primarily for the purpose of refining and improving the earlier version to make it even more useful.

The guide is in two parts. Part I covers grades GS-11 through GS-15, using a point evaluation system embodying a man-in-job concept through which the qualifications, contributions, and professional standing of the incumbent are considered directly in the evaluation process. Part II provides criteria for grades GS-5 through GS-9, using a conventional narrative format. These criteria assist in defining lower limits of Degree A of the four factors for positions in Part I. Positions in grades above GS-15 are covered in the Guide for Appraisal of Scientific Positions Proposed for GS-16, GS-17, and GS-18.

SERIES DETERMINATIONS

This grade-evaluation guide is not intended to affect series classification. Positions classified to grade by means of this guide are to be placed in the most appropriate classification series in accordance with definitions published in the Commission's "Handbook of Occupational Groups and Series of Classes," and amplifying material in published classification standards.

The "man-in-job" concept applied to grade-level determinations in Part I of this guide is applicable to series determinations also. The qualifications of the incumbent are usually highly significant

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[1]This guide should be filed immediately following the Work Leader Grade-Evaluation Guide.

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in selecting the most appropriate classification series for research positions.

TITLE DETERMINATIONS

The title structure in published position-classification standards typically varies in accordance with the nature of the occupation. For some series such as meteorology, forestry, and psychology, there are, for most positions, rather clear organizational, duty, and qualifications distinctions between research and other functions. The classification standards for such series prescribe separate research specializations with Research in the title for all research positions, including those not covered by Part I of this guide, e.g., supervisory, consultant and positions at levels below GS-11.

For other series such as physics, microbiology, geology, and mathematical statistics, there are generally no significant organizational, duty, and qualifications distinctions between research and many non-research positions. Accordingly, research specializations have not been established in standards for such series.

In general, it is impracticable to arrive at a generalization concerning titles of research positions for all occupations covered by this guide. Ideally, it would be desirable to rely on the position-classification standard for the occupation in question. This was suggested in the tentative draft of the revision. However, many agencies indicated in their comments that (1) the title structure in the older standards does not reflect their current views based on experience with the Research Grade-Evaluation Guide, and (2) they prefer the use of the prefix "Research" in the titles of research positions.

In consideration of the foregoing and in order to avoid excessive title changes, we are authorizing continuation of the present titling practice for research positions, as follows:

> When a research position is classifiable to a series for which a standard has been issued subsequent to June 1960 (the date of issuance of the original guide), the titling instructions in that standard will be used. For research positions in series for which there are no published standards or for which the standards were published prior to July 1960, agencies may continue to use the prefix "Research"

in the position title. In any case, specified criteria for titling positions as "Supervisory" should be applied as appropriate.

Part I -- Evaluation of Research Positions GS-11 Thru GS-15

COVERAGE

Part I of this guide is intended for use in the grade-level evaluation of positions engaged in basic or applied research in the biological, medical, agricultural, physical, or mathematical sciences, in engineering, or in psychology, when the positions involve either (1) the personal performance, as the highest level function and for a substantial portion of the time, of professionally responsible research; or (2) the direct and personal leadership of and participation in the activities of a research team or organizational unit when the primary basis of selection for the position is competence and capability in the performance of research rather than capability in supervising and managing a research organization.

Concepts

"Research" as the term is used above, is systematic, critical, intensive investigation directed toward development of new or fuller scientific knowledge of the subject studied. It may be with or without reference to a specific application. Such research includes, but is not limited to, theoretical and experimental investigations (1) to determine the nature, magnitude and interrelationships of physical, biological, and psychological phenomena and processes; (2) to create or develop theoretical or experimental means of investigating such phenomena and processes; and (3) to develop principles, criteria, methods, and a body of data of general applicability for use by others.

The term "professionally responsible" is intended to set a lower limit to the level of positions covered by Part I of this guide. This floor, which translates to GS-11 in the classification grade structure, means that, as a minimum prerequisite to evaluation by means of Part I, positions must operate at the level of responsibility typically associated with the independent performance of research investigation.

The term "independent performance" is not intended to exclude supervisory assistance in the form of general guidance as to scope and objectives, or advice and consultation during the planning, execution or evaluation stages, provided the incumbent retains personal responsibility for actually planning and conducting the study, and for organizing, evaluating, and documenting the results. It also does not exclude critical review of the product in terms of the care and thoroughness with which the scientific method was followed, the relevance of conclusions to the data, possible omissions, etc. Specific direction as to the plan of attack, detailed definition of the problem before assignment to the incumbent, the taking over of analysis, inference, or reporting by others are limitations on independence.

A member of a research team working on large problems which are not segmented into project assignments that can be conducted independently may be considered to meet this minimum criterion if (a) he fully participates as a professionally responsible member of the team in the substantive aspects of the work, and (b) he makes a contribution that may be regarded as equivalent to independent performance of limited but complete research project assignments.

In the research situation, team leadership, or supervision of a small unit, is commonly based on, and "carried" by, personal competence in research rather than by supervisory and administrative skill. Consequently, this guide provides for the classification of such supervisory positions by the same criteria as nonsupervisory research positions. On the other hand, some positions involving team leadership or supervision of a small unit, and nearly all positions involving direction of larger research organizations, require--in addition to research competence--marked supervisory and administrative ability. They are therefore to be classified, in part, by other criteria.

The crux of the distinction between the two situations, of course, lies in the actual operation of the positions rather than in the number of subordinates. A supervisory position for which research competence forms the primary basis for selection and evaluation should be classified under this guide as a "team leader"; a position for which supervisory or administrative abilities are the paramount considerations in the selection and evaluation process require the use of other standards. In some situations, it will be desirable to use both this guide and the Supervisory Grade-Evaluation Guide to appraise the grade level of the position.

Related functions

In terms of characteristics of the work situations, research and development activities may be thought of as a spectrum from basic research, at one extreme, through applied research to development, test, and evaluation at the other extreme. The coverage of the guide is deliberately focused on the basic and applied research end of the spectrum.

This is not to imply that positions in basic and applied research are necessarily any more grade-worthy than positions in development, test and evaluation, or that the development, test and evaluation functions do not also call for a high degree of originality and inventiveness. Rather, the guide is focused on basic and applied research because of the differences in work situations, and the differences in language and criteria which are useful in determining grade levels.

For example, it is least possible to define or measure basic research assignments, or the expectations in terms of results. For development, test and evaluation, the assignment frequently becomes a fairly definable thing and the desired results are known. Further differences extend even to the personal interests and characteristics of workers at the opposite ends of the spectrum.

There are, obviously, many positions in the "gray area" between the extremes, i.e., many positions which involve a combination of applied research and experimental development. The application of this guide to such positions must be a matter of judgment, based on determining whether there is sufficient involvement in research to render the guide applicable.

This guide is intended for use in the evaluation of positions which are essentially full-time research positions. It may also be used to appraise the research portion of mixed positions. However, in some cases, particularly where research and other functions are intertwined, it will be difficult to determine whether a position is as a whole a research position for which this guide is a suitable measuring instrument. To use this guide to evaluate such positions, all the following criteria should be satisfied:

1. The position is predominantly characterized by systematic investigation of theory, experimentation, or simulation of experiments.

2. The work is characterized by research-type application of the scientific method including problem exploration and definition, planning of the approach and sequence of steps, execution of experiments or studies, interpretation of findings, and documentation or reporting of findings.

3. There is a clear requirement for the exercise of creativity and critical judgment, variation in which may materially affect the nature of the end product.

4. The qualifications, stature, and contributions of the incumbent have a direct and major impact on the level of difficulty and responsibility of the work performed.

5. Research capability as demonstrated by graduate education and/or research experience is a significant requirement in selection of candidates.

Exclusions

This guide is not intended for use in classifying positions involving the management coordination or administration of programs of research where such responsibilities represent the controlling or paramount features in the assignment; positions primarily responsible for monitoring research grants or contracts; positions of consultants who are not involved in the personal performance or participating leadership of research; positions involving the performance of limited elements of research work; positions involving primarily engineering development, test, and evaluation; positions involving primarily library-type research; positions involving research in such social sciences as history, geography, economics, and anthropology; positions limited to the conduct of field surveys to collect scientific data on natural phenomena, such as the collection of meteorologic, hydrologic, oceanographic, geologic, or biologic data; or positions limited to collection and identification of entomological or other specimens for scientific collections.[3]

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[3]The exclusion from the coverage of this guide of positions engaged in research administration and coordination, systems development and evaluation, research in social science, and other functions should not be construed as implying a lesser degree of concern for the impact of the incumbent on the dimensions of the position in such situations. It reflects rather a lack of fit of the specific criteria used in this guide.

Obviously, some positions are not clear-cut. The conduct of field surveys for the purpose of collecting and reporting data, as such, is not within the narrow definition of research in this guide and is specifically excluded from coverage of this guide. However, some scientists engaged in such work may be making "theoretical and experimental investigations" and developing "principles, criteria, methods and a body of data of general applicability." The fact that the scientist uses research methods and interprets his findings in the light of established principles and hypotheses has little bearing on the decision if the position does not satisfy the coverage criteria. The purpose of the work, as determined by responsible management, usually governs whether or not the position requires the conduct of substantial research of the type covered by this guide as an integral part of the work.

THE INTERACTION OF THE RESEARCH SITUATION AND THE RESEARCHER

The duties and responsibilities of a research position are especially dependent upon the interplay between the research situation or assignment (within an appropriate job environment) and the individual qualities of the incumbent. Creativity and originality are inherently of central importance in a research situation, because the purpose of research is to extend man's knowledge and understanding. Yet, while the job situation may call for creativity and originality, the extent to which these qualities are actually brought into play is dependent in large part on the incumbent. Furthermore, while nonresearch situations are typically structured as to breadth

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Thus, there are many types of excluded positions--particularly those which are defined broadly and require substantial creativity--in which the qualifications and professional stature of the incumbent will materially affect the grade level of the position. Even though the published classification standards for such positions do not provide specific guidance in consideration of the man-job relationship, a classification approach which accords consideration to the qualifications of the incumbent comparable to that in this guide may be used as appropriate. For example, for appraisal of engineering systems development positions, panels of engineers and position classifiers, similar or identical to those used for research positions, may be utilized to consider the impact of the qualifications and professional stature of the employee on the various individual factors set forth in the appropriate professional engineering standard.

(necessarily so, in order to fix responsibility and prevent functional overlapping) the research situation is typically expandable in breadth in accordance with the incumbent's capabilities. Hence, it is recognized that where the nature of the research situation involves a high potential for original and creative work, the work of the position may be performed at any one of several levels, depending in part upon the level at which the incumbent is capable of working and his motivation. This leads to what may be termed a "man-in-job" concept, based on the interaction of the assignment and the incumbent.

This concept is not unlike the principle, long recognized in many nonresearch positions, that the qualifications of the incumbent may materially modify the position as actually performed. There are, however, two factors which make it particularly important and desirable to recognize this man-in-job concept in research positions. First, because of its "unlimited ceiling," and "expandable breadth," the research situation is much more likely to provide opportunity for full play of the incumbent's capabilities than the frequently more structured and limited nonresearch situation. In the second place, it is likely that in the nonresearch situation the incumbent's impact on the job will be reflected in ways (such as additional duties or functions; greater authority for action; more difficult assignments where the difficulty of assignments can be predicted; less supervisory review, etc.) which are less subtle, and which can be identified and measured by more conventional means.

In recognition of the fact that the incumbent's personal qualifications do, in a research situation, have a profound impact on the dimensions of the job which results, this guide provides for considering both the research situation or assignment, and the qualifications of the scientist who occupies the situation or assignment. These factors together constitute the position actually being performed and form the basis for determining grade level.

CLASSIFICATION OF VACANT POSITIONS

The "man-in-job" concept expressed above would seem to lead to difficulty in classifying vacant positions. This difficulty is, however, more apparent than real. A vacant position may be classified

either (1) on the basis of a total factor pattern consonant with the qualifications to be required of any candidate selected for the position (then, obviously, the qualification requirements should not be compromised in the selection process without reconsidering the impact of such compromise on the classification); or (2) if a candidate has been tentatively selected, in consideration of the factor pattern appropriate to his qualifications. Then, obviously, the position evaluation must be reconsidered if the tentatively selected candidate is not finally appointed, and other candidates of different qualifications are considered.

RELATIONSHIP TO GRADES OF SUPERVISORS

This guide is expressly designed to recognize the grade value of nonsupervisory performance which involves a very high degree of technical independence, a high degree of originality, and a high level of professional recognition and contribution. It is based on the thesis that while supervision is one ladder to high-level responsibility in scientific work, there is another ladder--the ladder of personal creativity and scientific contribution. While a good supervisor can do much to create a favorable climate and to stimulate creativity and originality, in the final analysis, creativity and originality come from within the person who displays them.

Since these factors are personal to the incumbent, are subject to "supervision" to only a very limited degree, and are an alternate ladder to high-level work, it is not considered necessary that supervisors of research work always be in higher grades than any of their subordinates. In other words, it may be possible for the contribution of a highly creative nonsupervisory researcher to merit the same grade (for different reasons) as the contribution of the supervisor of the organization or unit. Nor is it considered that this situation can exist only where the supervision is purely administrative in nature. Technical supervision, including overall evaluation of results and guidance as to priorities of research to be undertaken, may be present without necessarily limiting the originality and creativity of subordinates.

Thus, positions graded under this guide may, in some instances, be properly classified in the same grade as, or conceivably (albeit rarely), in a grade above that of the supervisor of the position.

This can occur when the grade of the researcher is determined by highly independent personal performance and his personal creativity, stature, and contributions.

As indicated under "Coverage," many supervisory research positions may be classified under the team leadership criteria in this guide. Additional guidance in the evaluation of supervisory positions will be contained in the Supervisory Grade-Evaluation Guide, Part II, to be issued shortly.

FACTORS FOR EVALUATING RESEARCH POSITIONS

While the specifics of subject matter dealt with will vary according to the scientific or engineering field involved, grade levels of research positions have been found to depend on essentially the same elements, regardless of subject field. In this guide, these common elements have been grouped into the following four factors:

I. The research situation, or assignment
II. Supervision received
III. Guidelines and originality
IV. Qualifications and scientific contributions

Factor IV, Qualifications and Scientific Contributions, is double-weighted to reflect its importance and to offset what would otherwise be a disproportionate orientation toward the assignment and work situation in the other factors. It is recognized that there is considerable overlap between these factors. However, each is focused on a different aspect of the job-incumbent relationship. By considering and rating them separately, somewhat more precision and a greater degree of consistency can be obtained in the final evaluations than would be possible if a single overall evaluation were made.

The following notes relate to application of the factors:

Factor I, The research situation, or assignment

This factor deals with the nature, scope and characteristics of current studies being undertaken by the incumbent. The level credit for this factor should be based on a sufficient span of time to reflect the norm of current assignments rather than isolated and atypical projects. However, this factor is intended to reflect the situation or assignment in the current job, rather than a summation of the incumbent's assignments over a long period of time.

In the case of a true team leader, i.e., one who is considerably more than a straw boss, a level should be credited which reflects the scope and character of projects being conducted by his team. In the case of a team member, the level should be based not on the total projects carried by the team, but upon the specific projects, or portion of the team load, carried by the incumbent.

It is the inherent difficulty and complexity of the research problem(s) which determine the level to be assigned for this factor, not the question of whether research is basic or applied.

For measurement purposes, the primary considerations in the research assignment are its scope and complexity, its objectives, the means of accomplishment, and the expected end results. The breadth of the problem and the depth or intensity of the required investigation are basic issues. The extent of related research studies, the extent to which objectives can be defined, the number of unknowns, the critical obstacles, and the variety and intensity of the knowledges which must be brought to bear for the solution of problems are also appropriate measures of relative difficulty and complexity.

In considering the expected end-product of research effort, the impact of the results on scientific theory and practice may be of significance. Also, important in consideration of the end-product are the extent and complexity of the validation processes required, the necessity for conversion of abstract concepts to hardware and/or to easily understood statements of theory, and the fruitfulness of the product in solving the initial situation and in opening new areas of investigation.

Factor II, Supervision received

This factor deals with the supervisory guidance and control exercised over the position of the researcher, and also relates to the current job situation. Considerable care is required to evaluate this factor. In a research situation, a considerable amount of effective supervision may exist with only a minimum of formal supervisory contact. On the other hand, consultations with colleagues of higher, lower or equal standing in the organization are essential to maximum effectiveness of researchers at all levels, and should be distinguished from supervision.

The effect of controls upon the positions may be measured by the incumbent's freedom for determination of course of action, and the degree of finality of his recommendations and decisions. Also to be considered are the manner in which he receives his assignments, the opportunity for procedural innovation and the degree of acceptance of his final product.

Factor III, Guidelines and originality

This factor deals with the creative thinking, analyses, syntheses, evaluation, judgment, resourcefulness, and insight that characterize the work performed in the current job situation.

Guidelines usually consist of the literature in the field, procedures, and instructions; or precedent situations which may be adapted or modified to meet the requirements of the current situation. Points to be considered in relation to these guidelines are: (l) the extent and nature of the available written guides, (2) the intrinsic difficulty encountered in applying the guides in terms of their ready adaptability to the current situation, and (3) the degree of judgment required in their selection, interpretation, and adaptation.

In assessing the impact of creativity found in the position, three considerations are important. The first consideration involves the requirement for original and independent creation, analysis, reasoning, evaluating, judging, and choosing between alternative methodologies. Also to be considered is the required interpretation of findings, translation of findings into a problem solution, and recording of these findings and interpretations in a form usable by others as well as in application to specific end-products. The third consideration is the impact of theories, principles, concepts, techniques, and approaches developed by the incumbent upon the scientific field of his research effort.

Factor IV, Qualifications and scientific contributions

This factor is not restricted to present and immediate past job performance. It is intended to focus on the total qualifications, professional standing and recognition and scientific contributions of the researcher, as these bear on the dimensions of the current research situation and work performance. Particular care must be observed to consider only those features of the factor which have a significant impact on the job.

The degrees of Factor IV are expressed in part in terms of standing and recognition in a specialized field. A researcher who is a recognized specialist in one field may be reassigned to a related field without change in degree of Factor IV, when it is expected by management that the researcher will probably perform at substantially the same level of competence after a reasonably short orientation period.

In evaluating this factor, consideration should be given to negative findings, which may be contributions to knowledge and guides to further research just as much as "positive" findings.

In some research situations, security regulations or other circumstances prevent publication of research results, and make it impossible to evaluate the work on the basis of its impact on the larger scientific community. In such cases, the work will have to be evaluated by means of the best possible judgment of its importance and the impact it would have if it could be published.

Undue emphasis should not be accorded mere number of publications; their quality and scientific significance, and especially the number of quality contributions, are more important.

Recency of accomplishment is important. Although the total history of accomplishment is considered, recent research or similar activity which assures maintenance of research competence is essential to full credit for past accomplishments.

Research positions of the type covered by this guide are characterized by a continuing personal struggle to keep abreast of rapidly advancing and changing disciplines. In resolving borderline determinations of degrees of this factor, consideration should be given to whether the incumbent is engaged in current and vigorous professional development.

In evaluating the degree of Factor IV, Qualifications and Scientific Contributions, consideration may be given to the level of education completed. In general, research positions covered by this guide are of such nature that a bachelor's or higher degree is typically a requirement. (Some but not all qualification standards for research positions include such a requirement.) Moreover, for some types of work, particularly basic theoretical research, graduate education is generally regarded as almost essential to the professional stature represented by the higher degree levels of Factor IV. On the other

hand, a doctorate in and of itself would not warrant more than Degree A. However, a researcher with a Ph.D. whose graduate work demonstrated superior research ability (as defined in applicable qualification standards) may be assigned Degree B.

EVALUATION SYSTEM

Each of the four primary factors which must be evaluated has a very wide degree range. To serve as key points for evaluating each factor as it applies to a particular position, three degrees--A, C, and E--with point values of 2, 6, and 10, respectively (4, 12, and 20 in the case of Factor IV) are defined in the degree definitions below. Definitions are not included for intermediate degrees B and D, point values 4 and 8, respectively (values 8 and 16, in Factor IV), because we have not been able to develop language precise enough to express these degrees without some overlapping of words. However, degrees B and D and their point values are an integral part of the plan, and are to be used when an element is determined to fall between the defined degrees.

Ordinarily, the use of point values between any two of the five degrees (e.g., 3 points for a degree of Factor I between A and B) is not recommended. Under most circumstances, such refined distinctions in judgment cannot be reliably made, and efforts at too much refinement may only result in a false appearance of precision. However, the use of these values is not precluded under circumstances in which their use is supported by sound judgment.

The evaluation system involves a separate determination of the proper degree (A, B, C, D, or E) for each factor; assignment to each factor of the point value of the degree assigned; and conversion of the total point values to a GS-grade by means of the Grade-Determination Chart and accompanying instructions. If a position fails to measure up to degree A for a factor, it need not be assigned any points for that factor. (Failure to measure up to Degree A for Factors I or II would preclude use of Part I of this guide.)

The definition of Degree E for each of the four factors is followed by a definition titled "In Excess of Degree E." These definitions do not illustrate specific degrees, nor do they have assignable point values, but rather are intended to provide additional guidance

concerning the intent of Degree E. Thus, these "In Excess of Degree E" statements are useful elements of the guide for appraisal of positions in grades GS-15 and below. If, for one or more factors, a position exceeds Degree E (not necessarily to the extent shown by the "In Excess of Degree E" statement) additional points may be assigned by extrapolation.

These "In Excess of Degree E" statements of the factors point up the absence of a GS-15 ceiling on researcher positions. Although these higher levels of the factors are not directly translatable in terms of specific grades above GS-15, they are useful as indicators of positions which support allocation above GS-15.

Evaluation systems of this type have been found to be useful aids to the formulation, recording, and consolidation of a series of judgments. The fact that subjective judgments are quantified should not be allowed to obscure the fact that they are judgments and that final decisions should rest on sound application of judgment rather than upon uncritical application of numbers. In applying a degree definition the definition as a whole, in its total context, must be applied--not isolated words or phrases.

The interrelationship and interaction of the factors need to be considered carefully in assigning factor degrees. In general, the correlation of the factors (and good management practice) would tend to preclude more than a 2-degree difference between the factor degrees assigned to different factors. For example, the scope and complexity of the actual research situation (as distinguished from what it might be) need to be correlated with the ability and competence of the incumbent. Thus, if a researcher with Degree E qualifications were to undertake what is generally regarded as a typical Degree A assignment, his depth of insight and penetration and original approach could convert the routine Degree A assignment to a complex Degree C or higher assignment.

PROCEDURAL SUGGESTIONS FOR USE OF EVALUATION SYSTEM

The procedures for application of this guide are, of course, a matter for agency determination. The guide may be applied by procedures ranging from normal use by position classifiers (with adequate care and attention given to ascertaining from subject-matter specialists the degree of novelty and complexity of projects and the contributions and professional stature of the incumbent), to application by a panel with joint researcher-classifier membership.

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However, because statistical evidence indicates that more reliable results may be expected if panels are used, the use of panels is recommended.[4] Since some of the judgments called for by the guide can best be made by researchers, with their fund of relevant technical knowledge, and since joint participation on the panel affords an excellent opportunity for close cooperation and the merging of the contributions which can be made by professional personnel and by classifiers, joint researcher-classifier membership on panels is recommended.

If panels are used, we suggest that they include a reasonable diversity of disciplines to assure a better perspective with respect to the relationship of the specific position to broader areas of research. (The limited statistical evidence available indicates that panel members in other disciplines than that of the position being rated can rate accurately if the facts regarding the position are clear.)

Where panels meet as a group, and reach an understanding as to job facts before they undertake to evaluate the job, results seem to be more consistent than where a dossier concerning the job is passed around and each attempts to rate the job without prior discussion. However, care needs to be exercised to confine discussions prior to rating to facts, and to avoid prejudicing the individual ratings by premature expressions of conclusions. The individual raters should rate independently. Because of the importance of subjective judgments of knowledgeable scientists and engineers in the evaluation process, the classification record should identify the scientists and engineers who provided the appraisals, individually or as members of panels.

Some agencies that have reported successful use of evaluation panels in the use of the guide have limited the use of panels to positions at GS-13 and above in order to reduce the workload on key professional personnel. Other organizations report that collateral values derived from the use of evaluation panels warrant the additional effort and cost of using the panel method at lower grades, as well.

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[4]For detailed information concerning the analysis and the results obtained, see "A Rating Scale Method for Evaluating Research Positions," by H. Alan McKean, John Mandel and Mary N. Steele, in July-August, 1960 issue of Personnel Administration.

Information regarding achievements, publications, appearance before professional organizations, reviews of the researcher's work, etc., will need to be developed when the position is reviewed. This may be presented in a variety of ways--for instance, by the supervisor to the panel--but it also needs to be incorporated in a brief summary of the more important background elements which can be appended to the position description. Information concerning the incumbent will need to be redeveloped or modified with changes in incumbency or the competence and stature of the incumbent.

Research positions are particularly susceptible of changes in performance which may occur gradually over a period of time. This makes it particularly important that they be periodically reviewed to determine what changes may have occurred. Many research installations have promotion panels make periodic reviews of the qualifications and professional development of their researchers, with a view to recommending promotions for those regarded as qualifying for a higher grade. Although the role of such panels may vary, they commonly evaluate the knowledges, abilities, personal qualities, achievements, and contributions of the candidates as these relate to the requirements of the position to be filled. Such appraisals of the man-job relationship for purposes of selecting candidates for promotion require knowledge and judgment similar to that required for grade-level evaluation. Accordingly, agencies may find it helpful to use a single panel for promotion, position classification, employee development, and other purposes.

This guide requires coordination and makes possible a meaningful integration of the qualifications review and the classification review. It provides a ground on which the job knowledge, and knowledge of the incumbent's performance and capabilities, which are possessed by the technical staff of the organization, can be intelligently related to classification and qualification standards and the other personnel and management processes. Such coordination and management partici-pation should do much to provide a basis for more effective personnel management, in a broad sense, with regard to research positions.

A number of agencies have reported values in application of the guide which extend well beyond its use as a classification instrument. This guide has been viewed as a major tool in improving the public image of the Government service. Recruiters for research organizations have effectively used the guide in informing prospective candidates of the modern personnel management practices in research administration in the Federal service and of the opportunities to advance to the highest levels as an individual researcher without supervisory responsibility.

GRADE-DETERMINATION CHART

Total point value assigned to the four factors may be converted to grade in accordance with the chart below.

Conversion Scale	
Classification grade	**Total of factor point values**
GS-11	**8-12 [14]***
GS-12	**16-22 [24]***
GS-13	**26-32 [34]***
GS-14	**36-42 [44]***
GS-15	**46-52 [54]***

Where the points assigned to a position fall in the gap between ranges assigned to GS-grades, the position may be considered to be "borderline." Thus, it should be assigned to either the higher or lower of the two grades between which it falls in accordance with a judgment determination based on aspects of the position which may not have been fully considered in arriving at the point values, and in consideration of best alignment with other properly classified positions.

* Point totals in brackets illustrate ARS "grade ceiling" concept. For example: 24 points is the "ceiling" for grade 12. Assignment of 24 points always results in allocation to grade 12. Allocation to grade 13 always requires assignment of a total of at least 26 points.

DEGREE DEFINITIONS[5]

Factor I: The research situation, or assignment

Degree A (2 points)

Projects consist of scientific investigations of limited scope, with readily definable objectives, which require only fairly conventional techniques. Such investigations may stand alone as studies of specific phenomena or problems, or they may be segments in a structure of related investigations. In either case, the specific assignment typically requires the incumbent to perform or to participate responsibly in all phases of the complete research process including problem definition, planning, execution, analysis, interpretation, and reporting of findings.

Projects may be studies in new areas, where the objectives are clear-cut and fairly conventional means can be used; they may involve applying existing theory or methods to new classes of subjects, or to classes of subjects previously experimented with, under various controlled changes in conditions; or they may involve reruns or adaptations of previous studies in the light of changes in theory, improvements in techniques and instrumentation, etc.

Projects are expected to result in a publishable addition to scientific knowledge or in a comparable contribution to the development of a new or recognizably improved method or technique.

Degree C (6 points)

The incumbent is responsible for formulating and conducting a systematic research attack on a problem area of considerable scope and complexity. The scope of the problem area is typically such that it must be approached through a series of complete and conceptually related research studies. These may be carried out personally by the incumbent or by a team of which the incumbent is the leader. In terms of complexity, problems are typically difficult to define; require unconventional or novel approaches; require sophisticated research technique; and/or present other features of more than average difficulty.

Characteristically, research studies of this scope will result in a series of publishable contributions to knowledge which will: (a) answer important questions in the scientific field, account for previously unexplained phenomena, and/or open significant new avenues for further study; (b) represent an important contribution to the validation or modification of scientific theory or methodology relating to the topic area; (c) result in important changes in existing products, processes, techniques or practices; and/or (d) be definitive of a specific topic area.

[5]Substantive changes in degree definitions as compared to the 1960 version of this guide are marked by asterisks.

Part I

Part I

Degree E (10 points)

At this level, the research situation consists of: (1) Responsibility, ordinarily as a team leader, for formulating and guiding a research attack on problems in applied research which have been recognized as critical obstacles to progress or development in areas of exceptional interest. The solution of such problems would represent a major advance, opening the way for extensive related development; or (2) Responsibility for attacking basic research problems which have been recognized as exceptionally difficult and unyielding to research analysis so that their solution would represent an advance of great significance.

While it is not possible to stipulate "success" in the solution of such problems, for the research situation to be evaluated at this level a reasonable expectation of fruitful work on problems of such difficulty and magnitude is presupposed. In any case, a significant rate of progress is expected; or (3) *Responsibility as a team leader for attacking problems of such scope and complexity as to require subdivision into separate phases of which several are characteristic of Degree D. (Positions of this type necessarily involve substantial supervisory responsibility.)*

*In Excess of Degree E

The research situation is characterized by: (1) Responsibility as a team leader for formulating and guiding a broad scale attack on problems in frontier areas of critical importance to major national programs. The project is of such complexity and scope that it must be subdivided into a number of separate experimental and theoretical research phases, several of which are typical of Degree E of this factor; or (2) Responsibility for attacking basic research problems of such fundamental interest, extraordinary difficulty, and resistance to attack that (a) there have been numerous attempts by highly competent scientists to explore the area and to gain a fundamental understanding of the processes or phenomena; (b) new hypotheses, concepts, and techniques must be developed for attack, and interpretation; and (c) the successful performance of the work will lead to the major modification or important extension of current theory.

In either (1) or (2) above, the assignment and leadership exercised influence the shaping of agency program goals, advancement of programs and understanding in the total field, and the planned activities of numerous scientists in Government, academic institutions, and private industry.*

Factor II: Supervision received

Degree A (2 points)

Most typically, the specific problem is assigned by his supervisor with general instructions as to scope and objectives of the study. The study may, however, be suggested by the incumbent, and undertaken after supervisory approval. The incumbent confers with his supervisor regarding definition of the problem, its relationship to the broader research goals of the activity, and the development of a plan of attack. The direction and guidance thus received are aids to the incumbent in the critical problem definition and planning stages, but do not remove his personal professional responsibility for the completeness and adequacy of these steps. From this point, incumbent is expected to take responsibility for the study and pursue it to completion, solving problems ordinarily entailed in accomplishment of the work with only occasional reference to the supervisor. Decisions that materially change the nature of the work (e.g., decisions to discontinue work, change emphasis, or change plan of attack) originate elsewhere or are approved by the supervisor.

Incumbent interprets results of own work, and prepares reports and papers which are reviewed for inclusion of necessary supporting information, completeness, clarity and results. Work is reviewed for adequacy of method, for completeness and for results.

Degree C (6 points)

In programmed or applied research, the researcher is typically

assigned a broad problem area; in basic research he may not be given an "assignment," but may work with

substantial freedom within an area of primary interest. In either event, he is allowed substantial freedom in identifying, defining and selecting specific problems for study, being responsible for determining what appear to be the most fruitful investigations and approaches to the problem area.

The researcher is responsible, with little or no supervisory assistance, for formulating hypotheses, for developing and carrying out the plan of attack, for coping with novel and difficult problems requiring *modification of standard* methods, for analyzing and interpreting results, and for preparing comprehensive reports of findings.

The supervisor is kept informed, through occasional discussions, of general plans and progress of the work. The supervisor approves plans which call for considerable investments of time or equipment; and is responsible for final decisions concerning direction of work, and concerning changes in or discontinuance of important lines of investigation, particularly if they involve abandonment of what had been thought to be promising lines of investigation or of a substantial research investment. However, the researcher's professional judgment is relied on to such an extent that his recommendations are ordinarily followed. The supervisor attempts to create a climate conducive to the generation of ideas through staff discussions, seminars, etc. The researcher has full responsibility for decisions regarding use of equipment and other resources made available to him. His completed work and reports are reviewed principally to evaluate overall results.

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Part I

Degree E (10 points)

Technical supervision is nominal *and consultative in nature.* The researcher works under broad administrative supervision, which is *generally limited to approval of staffing, funds, and facilities,* and broad agency policies. *Within the framework of management objectives, priorities, and pressures for results, the researcher is expected to locate and explore the most fruitful areas of research in relation to the agency's program and needs and the state of the science involved; to take complete responsibility for formulating research plans and hypotheses and for carrying them through to completion; and to take full technical responsibility for interpreting findings, including interpreting their applicability to activities and interests of the agency, and their broader applicability to basic scientific methodology. Within the agency, these interpretations are accepted as technically authoritative, and become the basis for necessary administrative action. They are, of course, subject to further test and ultimate validation or modification by the scientific community *and management decisions on the use of the results of research.*

Part I

*In Excess of Degree E

The supervision received is characterized by: (1) a degree of confidence in and reliance on the researcher's productivity, competence, and judgment such that there is an unusual level of support of his recommendations and his most novel and as yet seemingly fruitless investigations; (2) responsibility such that interpretations, recommendations and conclusions having major impact on matters of great urgency and significance are furnished other agencies and the professional community without reference to or knowledge of higher authority in the agency, and (3) a supervisory relationship that fully reflects recognition of the researcher as both (a) a top technical authority in his field in the agency and (b) a distinguished and brilliant scientist.*

Part I

Factor III: Guidelines and originality

Degree A (2 points)

Existing theory and methods are generally applicable to most, though not necessarily all, parts of the problem. Available material may contain some inconsistencies, may be partially unconfirmed, and/or may suggest several different possibilities of dealing with the problem at hand. The originality required of an incumbent at this degree is primarily the development of a complete and adequate research design for his specific problem, based on use of sound professional judgment in selecting and adapting from available possible methods and techniques those best suited to the immediate problem. This may involve the application of highly complex (but established) experimental techniques, or some modification of details of technique or method. This degree involves only a limited amount of innovation or modification of procedures and techniques.

Degree C (6 points)

In basic research, available guides and precedents, e.g., existing literature in the field, are limited in usefulness (are contradictory, contain critical gaps, are only partially related to the problem) or may be largely lacking because of the novel character of the work being done. A high degree of originality is required in defining problems which are very elusive and/or highly complex, in developing productive hypotheses for testing, in identifying significant problems for study in developing important new approaches, methods, and techniques, and in interpreting and relating the significance of results to other research findings.

In applied research this degree typically involves development and application of new techniques and original methods of attack to the solution of important problems presenting unprecedented or novel aspects. This includes application of a high degree of insight to isolate and define the critical features of the problems; and application of a high degree of originality and ingenuity in adapting, extending, and synthesizing existing theory, principles and techniques into original and non-obvious combinations or configurations, and in defining and conducting the specific research studies necessary for the solution of the problems dealt with.

Part I

Degree E (10 points)

This degree of originality is represented by: (l) Creative extension of existing theory or methodology, or significant contribution to the development of new theory or methodology which is of such scope as to supplant or add new dimensions to a previous framework of theory or methodology (for example, the new theory may represent a higher abstraction which includes relevant prior knowledge, at least as special cases of the new and which accounts for phenomena which may have been inconsistent with prior theory); or (2) Responsibility (particularly in applied research), for applying a very high degree of imagination and creativity in the solution of problems of *marked* importance (for example, to the scientific field, to national defense, to health, to major segments of the national economy, etc.), for which there is an almost complete absence of applicable guidelines, pertinent literature, and methodology.

Part I

*In Excess of Degree E

The work is characterized by the application of such unusual productivity, creativity, and depth of insight into the fundamental nature of phenomena and their relationships as to produce a substantial variety of new methods and techniques, of new approaches to formerly intractable problems, of identification of new problems to be attacked, and of important new concepts and discoveries, inclusive of the type described in Degree E of this factor. New areas are opened up for exploration, the findings have widespread applicability to other fields of science and technology, and there is likely to be a major stimulus to scientific and technological effort and achievement in the field of endeavor.*

Part I

Part I

Factor IV: Qualifications and scientific contributions

Degree A (4 points)

The researcher typically **performs independent research, or serves as a full member of a research team. He has demonstrated, through satisfactory planning and execution of one or a few research studies, ability to define his problems clearly, to perform the necessary background research, to develop an appropriate plan of attack, to execute the research plan, to organize and evaluate the results, and to prepare acceptable reports of findings, with some guidance as to objectives and occasional consultations during the progress of his study.

Work may be expected to result (or has resulted) in co-authorship, in a secondary role, of one or more major papers or reports of considerable interest to the scientific field, or in primary authorship of one or more minor papers or reports which will serve (or have served) chiefly to fill narrow blanks in an existing framework of knowledge, or corroborate existing theory, or to report findings of limited scope.

The researcher serves as a source of information on his own research projects, principally to researchers within his own laboratory *or sphere of investigation, and on related or similar projects elsewhere.*

Degree C (12 points)

At this degree, the researcher has demonstrated his ability as a mature, competent and productive worker.** He will typically have authored one or more publications of considerable interest and value to his field (as evidenced by favorable reviews, by citation in the work of others, by presentations of papers to professional societies, etc.), and/or he will have contributed inventions, new designs or techniques which are of material significance in the solution of important applied problems.

His contribution involves leadership of a productive research team, or leadership in the conception and formulation of productive research ideas (as evidenced by the fact that his ideas have been the basis for productive studies by others, within or outside his immediate organization), and/or highly productive (in terms of both quantity and quality) personal performance of research of such originality, soundness, and value as to have marked him as a significant contributor to his professional field. He is beginning to be sought out for consultation by colleagues who are, themselves, professionally mature researchers. Further evidence of his emerging recognition may be selection to serve in important committee assignments of professional groups. He is qualified to speak and deal responsibly concerning technical matters in his area of immediate specialization with researchers within and outside his own organization.

Part I

Degree E (20 points)

At this degree, the researcher has demonstrated outstanding attainment in a broad, or in a narrow but intensely specialized field of research. He will typically have authored a number of important publications, of which at least some have had a major impact on advancing the field, or are accepted as definitive of important areas of it, and/or he will have contributed inventions, new designs or techniques which are regarded as major advances in basic or applied research, and which have opened the way for extensive further developments, or have solved problems of great importance to the scientific field, to the agency, or to the public.

Contributions at this degree are of such importance and magnitude that they serve to move the art forward to the extent that other researchers must take note of the advance in order to keep abreast of development in the field.

He is sought as a consultant by colleagues who are, themselves, **specialists in his field; he speaks authoritatively regarding his field in contacts within and outside the Government. Invitations to address *national* professional organizations, and recognition in the literature of his field through favorable reviews and numerous citations by others are further typical evidences of attainment. *For purposes of comparison with private employment, the level of attainment contemplated at this degree may be considered to be roughly comparable to that of a full professor at a major university.*

*In Excess of Degree E

The incumbent is a nationally recognized authority and leader in an area of widespread scientific interest and investigation. He will typically have received honors and awards from major national organizations for his accomplishments. He is sought as an advisor and consultant on scientific and technological programs and problems which extend well beyond his own field. His reputation as a scientific leader is such that he serves as a recruiting attraction for recent graduates who seek opportunities to work under his inspiration and guidance in order to catch some of his imaginative fire, critical judgment, and research technique.* His personal competence is likely to be a major consideration in agency sponsorship of programs in his field.

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June 1964

Part II--Evaluation of Research Positions Below GS-11

This material is for wide application, across the same occupational lines covered by Part I of the Guide. Positions covered in Part II are typically trainee or research assistant positions or involve the independent performance of limited research assignments.

CHARACTERISTICS OF GS-5 POSITIONS

GS-5 GS-5

Positions at this level are characterized by intensive training and the performance of supporting work in research requiring professional training but little or no experience.

Assignments are planned to (1) provide experience and training to orient employees to administrative policies and regulations, technical programs, research techniques, and operating procedures; (2) ascertain interests and aptitudes as a basis for more responsible assignments; and (3) contribute to the productive output of the research unit to which assigned.

Trainees at GS-5 receive detailed instruction and guidance. Work is reviewed in detail for correctness of methods employed, proper application of basic scientific principles and accuracy of results. Phases of work not covered by instructions or guidelines are referred to the supervisor or others for advice and instruction.

CHARACTERISTICS OF GS-7 POSITIONS

GS-7 GS-7

Positions at this level are characterized by advanced training in research techniques and methods and by the performance of work of limited scope and complexity, involving a variety of assignments which are accomplished by established methods, procedures and techniques and are minor phases of broader assignments of other employees. Assignments are typically selected to develop the employee for work of a higher level.

Part II
GS-7

Part II
GS-7

Assignments are accompanied by instructions as to the problem to be studied, the extent to which studies are to be carried, the approach desired and the general techniques to be applied. The supervisor spot checks work in progress and provides instructions or guidance on difficulties encountered during the performance of the work. GS-7 employees apply independently standard or specified research methods, tests, techniques, and procedures and develop simple work plans and preliminary conclusions which they present orally or in preliminary draft form for approval or revision. Unanticipated conditions are typically referred to the supervisor for guidance. The work is reviewed for technical adequacy and thoroughness of application of methods and techniques.

Judgment and some initiative are applied in planning simple details of the work as in deciding how to collect and present data; in determining from established guide material, the methods and techniques to use; in making simple adaptations of methods and techniques; and in recognizing circumstances requiring special attention.

CHARACTERISTICS OF GS-9 POSITIONS

GS-9

GS-9

Research studies carried out by employees at this level may be complex but are characterized by clear and specified objectives, investigation of a limited number of variables and self-directed work in planning and carrying out experiments in accordance with approaches which have been structured by others. GS-9 researchers generally plan project details on the basis of precedents established in related projects, and devise and recommend alternative methods of standardized analysis as a basis for solving moderately difficult problems. Generally, they have a higher degree of responsibility for factfinding than for fact interpretation.

Work is performed under the technical and administrative supervision of a researcher of higher grade. Immediate objectives are indicated by the supervisor, as well as the nature of results to be expected. Potential and actual sources of difficulty are discussed with supervisor. Supervisor reviews recommended work plans and inspects work to

Part II
GS-9

observe adequacy of research methods and practices and to give advice during the progress of the work. Completed reports are reviewed from the standpoint of adequacy, completeness, and validity of conclusions reached.

In general, precedents are available in the form of previous studies on related subjects, standard methods in textbooks, handbooks, or other literature, and, possibly, from manuals of procedure. Most assignments, however, have features which require other than the direct application of these guides so that incumbents at this level must select and adapt methods and piece together the best techniques applicable to the problem.

Judgment is required in insuring that tests, measurements and observations are made under conditions reflecting scientific and operating requirements and will yield valid results. Originality is evidenced in developing improvements and modifications to established procedures.

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When using the RGEG, determining the degree level to assign to Factor IV for Demonstrated Accomplishments is always difficult. The evaluation of Factor IV is critical since it is double-weighted both to reflect its importance, and to offset what would otherwise be a disproportionate orientation toward the assignment and work situation in the other factors. When evaluating Demonstrated Accomplishments, not only must the number of accomplishments be assessed--but the quality of each accomplishment must also be judged. The difficulty is further compounded because opinions can vary widely about the impact of an accomplishment, and impact is rarely reflected in the documentation (scientific publications). The RGEG stresses that regardless of the number of accomplishments, **quality must be present** before higher degree levels can be assigned.

The Accomplishment Rating Guide is used:

A. To help assess the quality of individual accomplishments. It identifies five **types** of accomplishments:

- Knowledge development using scientific principles in theoretical or experimental investigations;
- Knowledge application to an unknown or previously unexplored area;
- Methods development;
- Literature review and analysis; and,
- Leadership/Special Assignments.

The Accomplishment Rating Guide assists in establishing the relative quality weighting to be assigned to the incumbent's Demonstrated Accomplishments by serving as a "standard reference." Each of the accomplishments is then compared with the degree requirements of Factor IV in the RGEG. Relative quality level is assessed to identify the three highest-rated accomplishments, which are identified as the incumbent's "best work."

Illustrations:

- If **several** accomplishments have been identified that are of **considerable interest** to science or technology, Degree C may be credited.

- If **several** accomplishments have been identified which have had **major impact** on science or technology, Degree E might be assigned.

- If only one accomplishment is identified at a certain level, the corresponding degree level is **minimally** met.

B. To help incumbents identify and select leadership accomplishment(s).

Incumbents of formal research supervisory positions receive credit in Factor I for the scope and character of the programs of their units. They and scientific leaders have the opportunity to cite and document at least one leadership accomplishment under Factor IV among the 3-8 allowed. The examples of leadership accomplishment identified in the Accomplishment Rating Guide table at

the end of this subchapter illustrate how a leader can have impact. The most important concept in a leadership accomplishment is that **the accomplishment must result from activities of the leader**.

Illustrations:

- Consider a situation where a newly appointed research supervisor has a team of highly capable, enthusiastic scientists. Probably only minimal leadership is needed. But if high productivity of the team is maintained, some effort is required on the part of the leader and the quality of the leadership accomplishment is **acceptable**.

- On the other hand, if a new research supervisor has a team that has low productivity and the leader spends considerable time and significantly increases the team's productivity, to what might be considered "average," the leader is credited with a **higher quality** leadership accomplishment.

- Similarly, consider a research supervisor leading a team of highly capable scientists whose work was impacted by a major shift in Agency research priorities. If the leader is able to redirect their work without diminishing significantly their enthusiasm and productivity, the leader may also be credited with a **higher level** leadership accomplishment.

  NOTE: The above illustrations are for formal leadership situations, but the same rationale is used when time is spent in scientific leadership activities with comparable program impact.

Evaluation of leadership accomplishments must consider both the actions taken by the leader and the impact of the accomplishments. For high credit to be assigned, the actions of the leader should be innovative and effective, and the impact of the accomplishment must be significant. Moreover, the accomplishment must be the result of actions attributable to the leader.

As with a research accomplishment, **credit is not given for merely attempting to exert leadership**, i.e., just because a leader tried hard or because some limiting factor such as crop failure, drought, lack of technical support, etc., has an affect on the research. When research has had impact (i.e., made a major advance, opened the way for extensive further development, solved a problem of major importance, or conclusively shown that an approach will not work, etc.), the level of credit assigned is proportional to the impact. Similarly, if an extensive increase in productivity has been caused by a leader, a level of credit proportional to the impact is assigned. Except for the **nature** of a leadership accomplishment (indirect rather than direct), leadership is treated no differently from a research accomplishment when evaluating Factor IV.

C. To give credit for research-related accomplishments or special assignments when they are equivalent to a research accomplishment.

Whenever research-related or special activities are regular or recurring, they are incorporated into the official position description and addressed in an appropriate manner. However, the end product of a special assignment is often the equivalent of a research accomplishment. The Accomplishment Rating Guide can be used to assess these types of accomplishments.

Illustrations:

- A special assignment may result in the generation of information that enables the registration of a chemical or drug. The registration provides a new technique that can be referenced against the "knowledge development" and "knowledge application" types of research accomplishments. The principal difference is that the usual range of research activities may not have been involved and a technical publication is not available to document the accomplishment.

- Similarly, a special assignment might have impact on standards or regulations. Again, this type of accomplishment may be equated to a new knowledge or modification of concepts and can be referenced against the "knowledge development" or "knowledge application" types of research accomplishments.

- Other types of special assignments could result in a state-of-the-art report or the development of a handbook. In both instances, the end product can be referenced against the "literature review and analysis" type of research accomplishment. The significant difference is that the traditional "research approach" was not followed.

Incumbents who have spent a significant amount of time in a special assignment or other activity which has resulted in the equivalent of a research accomplishment should consider including them as one of their 3-8 most significant accomplishments.

NOTE: Preparation and documentation requirements for all types of accomplishments are discussed in Chapter 1 of this Manual.

ARS ACCOMPLISHMENT RATING GUIDE

Knowledge Development Using Scientific Principles in Theoretical or Experimental Investigations	
Acceptable *	**Corroborated existing knowledge** in a new situation using new and innovative procedures
Important	**Established new** knowledge, concepts, techniques or materials of **limited impact** on a broad area of research **or greater impact** on a narrow area of research
Superior	Established new knowledge, concepts, techniques or materials **of considerable importance and value** to science or technology
Outstanding	**Made a major advance** in a scientific field or provided new technology that opened the way for extensive further development

Knowledge Application to an Unknown or Previously Unexplored Area	
Acceptable *	**Applied known concepts and/or techniques** to deal with a new situation
Important	**Modified known concepts and/or techniques** to deal with a new situation of **limited importance**
Superior	**Modified known concepts and/or techniques** to deal with a new situation of **considerable value** to science, industry or the public
Outstanding	**Solved a problem of major importance** to science, industry or the public

* An accomplishment evaluated as unimportant because of very little or no discernible impact may be rated Unacceptable.

Method Development	
Acceptable *	**Used known** concepts to modify and/or develop facilities, equipment or techniques **of some importance** to research and/or industry methodology or approach
Important	**Modified known** concepts to develop facilities, equipment or techniques **of limited importance** to research and/or industry methodology or approach
Superior	**Extensively developed** facilities, equipment or techniques **of considerable importance** and value to research and/or industry methodology or approach
Outstanding	Accomplishment should be **comparable to making a major scientific advance**

Literature Review and Analysis	
Acceptable *	Restated **with essentially no change** or reported conclusions from previously published material
Important	**Restated or reviewed** previously published material from more than one source with **some resultant additions** to established knowledge of **limited importance**
Superior	Reviewed, analyzed, interpreted and synthesized scientific knowledge of **broad scope** with **significant additions** to established knowledge **of considerable importance and value** to science or technology
Outstanding	Accomplishment should be **comparable to making a major scientific advance**

* An accomplishment evaluated as unimportant because of very little or no discernible impact may be rated Unacceptable.

Leadership/Special Assignment	
Acceptable*	**Maintained** high productivity of groups, initiated or carried out program redirections, or accomplished special projects by means of actions considered **somewhat innovative**, producing **results of limited impact**
Important	**Attained or maintained** high productivity of groups, initiated or carried out program redirections, or accomplished special projects by **innovative** actions, producing **results of significant impact**
Superior	**Attained or maintained** high productivity of groups, initiated or carried out program redirections, or accomplished special projects by **very innovative** actions, producing **results of extensive impact**
Outstanding	**Attained or maintained high** productivity of groups, initiated or carried out program redirections, or accomplished special projects through **exceptional innovation**, **producing results considered equivalent to a major advance in a significant field**

* An accomplishment evaluated as unimportant because of very little or no discernible impact may be rated Unacceptable.

1. **Interpretation of the RGEG**

The RGEG is an OPM standard for use in classifying positions involving: (a) the personal performance of a research scientist either individually or as a team member, and (b) leadership of a research team or organizational unit where the primary basis of selection is research competence and capability rather than supervisory or administrative ability. Whenever the size of a team or organizational unit, or other management concerns dictate the need for marked supervisory and administrative ability in a position, other classification standards may be appropriate.

The RGEG is based on the premise that the **qualifications** of an incumbent can greatly expand a given research position in depth and/or scope. It is also based on the premise that the qualifications of an incumbent are directly proportional to the demonstrated research and research-related accomplishments of that incumbent. Thus, a research position cannot be classified without considering an incumbent in the position. It is important to remember that the RGEG aims at assessing the **impact and quality** of an employee's scientific contributions. **Quantity** of publications is discussed as being (at best) of secondary significance as an indicator of contribution.

The first 20 pages of the RGEG elaborate on the above points, develop the conceptual framework of how positions and incumbents will be measured for classification purposes. These pages also suggest overall philosophy to interpret the standards presented on pages 22 through 29 thereof.

Several extremely important concepts are contained in the first 20 pages of the RGEG and their interpretation is critical when using the RGEG. Interpretations of these concepts, appropriate to ARS, are discussed in the following sections. Other issues which sometimes become involved in application of the RGEG are also discussed.

a. **Appropriateness of the RGEG** (See pages 5-9 of the RGEG)

When using the RGEG, a major concern is whether a position involves research for which the RGEG is an appropriate classification standard. In making the determination, the RGEG points out that all five of the criteria listed on page 8 ***should*** be applicable before the Guide is used to classify a position. In addition, the RGEG defines the research process in the Degree A definition of Factor I.

The RGEG must not be applied to positions described as exclusions on page 8-9 of the Guide. When an incumbent is not performing responsibly in the complete research process, or when a position's primary activities fall outside of the research boundaries, the position is nonresearch and the RGEG is not the appropriate position classification standard.

Some scientific positions are intended to provide professional support to research positions in carrying out the program work of ARS. Their incumbents perform responsibly in a complete research process but are involved in a support role. To illustrate, a person might be receiving training and perform in all activities of the research process but with extremely close supervision--use of the RGEG would be appropriate. On the

other hand, a person might be heavily involved in planning and executing experiments and analyzing data, but not be substantively involved in the other activities of the process. Such a position is research support rather than technician (if scientific professional knowledge is required), and the RGEG is not appropriate. Regardless of grade level, a support position will generally have limited (if any) involvement in the problem definition and interpretation of results phases of the research process.

There are other types of scientific nonresearch positions (involving neither responsibility for nor participation in all activities of the research process) that perform program work for ARS where the work is of a service-type nature. The RGEG is not appropriate for these positions.

Another way to determine if the RGEG is an appropriate classification standard is to examine the end product of an incumbent's work. This can be done by evaluating the expected results stated in the research assignment to see if a research accomplishment may result. If it is determined that no significant accomplishments will result when measured in Factor IV, the RGEG is not an appropriate classification standard.

b. **Independence** (See pages 5-6 of the RGEG)

"Independence" or "independent" has various meanings. At grade GS-11, independent means the incumbent is capable of **performing responsibly in all phases of research** but with close supervision, particularly in the review of work performed. At grade GS-12 and above, independent means the incumbent is capable of **accepting responsibility** for all phases of research, with limited technical supervision in **most** phases of research, ranging to essentially no technical supervision in **all** phases of research at higher grades. It should be noted that working alone is not required. When applied to a member of a team where large problems cannot be segmented into identifiable areas, independent means the incumbent is fully participating as a professionally responsible member of the team in substantive aspects of the work, or makes contributions that may be regarded as equivalent to independent performance.

c. **Changing Assignments** (See page 15 of the RGEG)

Assessing qualifications when an incumbent changes research assignments is sometimes a concern. The RGEG points out that the total qualifications of

a researcher must be considered as they bear on the dimensions of the current research situation and work performance. On the other hand, the RGEG recognizes that a specialist in one field may be reassigned to a related field without change in degree of Factor IV when it is expected that the researcher will perform at substantially the same level of competence after a reasonably short orientation.

How far expertise can be stretched or how quickly new expertise can be acquired must be evaluated on a case-by-case basis. When a panel determines that an incumbent can be expected to make the transition, full credit should be given. However, if the panel determines that the employee's expertise cannot reasonably be expected to fully meet the minimum requirements of the new assignment, full credit for past accomplishments should not be given.

2. **Long-Term vs Short-Term Research**

Long-term research projects such as watershed research, fruit tree genetic studies, or large animal research, often require several seasons or generations in order to conduct a single experiment. By contrast, short-term research may require only a few weeks to complete an experiment. Some scientists engaged in long-term research feel this time differential places them at a disadvantage in terms of RGEG criteria--presumably because of undue concerns about numbers of publications. If panelists avoid the fallacy of giving undue weight to quantity (such as mere number of papers), and instead assess quality and impact, this disadvantage is a misperception, because:

a. Short-term, quickly completed experiments generally yield only partial solutions to a larger problem. A series of short-term experiments is normally required to generate a significant accomplishment.

b. Usually, more than one long-term experiment can be conducted simultaneously by a single scientist; and, in addition, research programs can be a mixture of long- and short-term projects.

c. The amount of effort and time required to produce an accomplishment is weighed, as well as the impact of the accomplishment, in evaluating research positions.

d. Factor IV also considers peer recognition and consultation activities. These facets are more dependent on competence and informally recognized contributions than on mere numbers of publications. Thus, if panels follow the intent of the RGEG in evaluating Factor IV (count quality accomplishments and consider professional standing and recognition in a scientific field to cross check), the issues of basic vs. applied, long-term versus short-term, or any other classification comparison of research are irrelevant. The RGEG only attempts to distinguish quality and impact.

3. **RPES-Related Information on Patents**

The following information was jointly developed with the Coordinator, National Patent Program, ARS Office of Technology Transfer.

a. **Flow of Patent Documents**

(1) **ARS Scientist** prepares an Invention Report which, along with related documentation, is submitted through his/her Research Leader to the Patent Advisor serving his/her Area.

(2) **ARS Patent Advisor** performs preliminary prior art review of Invention Report. If Patent Advisor is reasonably certain that report is patentable, he/she takes report to ARS Patent Committee.

(3) **ARS Patent Committee** reviews the Invention Report, based upon predescribed criteria (which includes commercial potential) and

recommends disposition of the report.

(4) **ARS Patent Advisor** submits report of cases recommended for approval by the Patent Committee, together with sufficient background, to the appropriate Area Director and Assistant Administrator. In view of the fact that the cases have been carefully reviewed by the Research Leader and Patent Committee, rejection by the Area Director should be rare. If an Area Director disagrees with the Patent Committee, the Area Director contacts the Office of Technology Transfer, which seeks additional information from the National Program Staff and other appropriate parties before making a final decision.

(5) **ARS Patent Advisor** prepares the necessary documentation and "prosecutes the patent."

(6) **USDA Patent Attorney** in Office of General Counsel (OGC) reviews Patent Advisor writeup to assure adequacy and forwards to the U.S. Department of Commerce, U.S. Patent and Trademark Office (PTO).

(7) **Patent Examiner** in the PTO makes final ruling on the patent. The process essentially involves the ARS Patent Advisor convincing the PTO Patent Examiner that the invention is patentable to the Agency. If PTO rules favorably on the patent, it issues a "notice of allowance" which specifies the future date a patent becomes effective. About 2 months later, the PTO issues the formal patent registration certificate.

b. **Other Relevant Information**

The term "patent pending" means merely that the PTO has received, logged, and numbered a patent prosecution application: no technical review of any sort (other than within ARS and USDA) can be inferred from this term. A license can be issued during the "patent pending" period. Licenses are of two types: "nonexclusive," gives any firms receiving one the right to use the invention, while "exclusive" restricts use to one or a very limited number of firms. The latter is of increasing significance. By prohibiting competitive use of the invention and guaranteeing to a greater extent the licensee's profit, exclusivity encourages investment of development funds required to make an invention commercially available and useful to the public. Inventors receive a license award (portion of license fees) annually on royalty-bearing licenses. Licensees are required to submit annual reports explaining the use being made of the invention. Twenty (20) years after the patent application was filed, the patent enters the public domain and is no longer patentable or protected. The patent does, however, remain as prior art in its field until it is improved.

Under United States patent law, a patent applicant has 1 year from the date of publication or other public disclosure or use to file for a United States patent covering the invention. After that, or if the patent application is not pursued, anyone can pick up and apply the technology. Foreign patent rights are lost if a publication appears before a United States patent is filed at the PTO.

c. **Key Points of RPES Credit Policy**

(1) Patents are a form of technology transfer.

(2) As with publications, the number of patents is not as significant as the **impact** of the invention. In the case of ARS patents, impact is measured largely in terms of technological, economic or commercial impact.

(3) There are **three points** when a patent should be considered for credit under RPES procedures:

(a) The award of a "notice of allowance" by PTO is comparable to acceptance and publication of a manuscript by a refereed journal.

(b) A scientist can document significant application of the invention in terms of new products, improved products, lower cost to consumers, stimulation of investment or some other form of demonstrable impact. This may include licensing of the application or patent and subsequent progress toward commercial use.

(c) The Demonstrated Originality (Factor III) segment of the case writeup may cite patents, CRADA's or licensing agreements as evidence of a scientist's originality.

(4) Patents are of equal value as manuscripts in terms of documenting accomplishments. But, they are usually significant only in terms of acceptance and subsequent impact... again comparable to manuscripts.

(5) To determine the status of a patent, contact the Office of the Coordinator, National Patent Program.

Exhibit 3 - ARS Form 516

RESEARCH POSITION EVALUATION WORKSHEET ***Name:** ***Date:**

Initial Score Summary: F I ___ + F II ___ + F III ___ + F IV ___ = ___ Points

FACTOR IV - QUALIFICATIONS AND CONTRIBUTIONS

A. Demonstrated Accomplishments:

Refer to ARS Accomplishment Rating Guide to identify highest-rated accomplishments (maximum of 3). Summarize the significance/impact of these highest-rated accomplishments, and explain incumbent's role in each, in brief sentences:

Recency of accomplishment [ ] is [ ] is not a concern.

B. Stature, Recognition and Impact:

The following 3-5 honors, awards, and/or invitations best reflect incumbent's stature:

Incumbent is most recognized for research in the area(s) of:

Recognition is [ ] local [ ] regional [ ] national [ ] international in scope.

Diminished stature/recognition [ ] is [ ] is not a concern.

C. Advisory and Consultant Activities:

Incumbent has a [ ] poor, [ ] fair, [ ] good, [ ] excellent record of participation in scientific meetings.

Incumbent's 3-5 most significant advisory/consultant activities are:

Diminished advisory/consultant activity [ ] is [ ] is not a concern.

The panel assigned Degree ____ for this factor because:

FACTOR I - RESEARCH ASSIGNMENT

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A. Assigned Responsibility:

Incumbent occupies a [ ] Lead Scientist [ ] Research Leader [ ] Center/Laboratory Director position, or [ ] has no formal leadership role.

Incumbent's current assignment involves research on (identify assignment limits/boundaries):

In team research, incumbent usually functions as [ ] leader or [ ] member, providing expertise in the area of:

Assignment is [ ] new (since_____) or [ ] continuing.

Incumbent has substantial [ ] service [ ] technology transfer [ ] other special assignment

(identify _____, requiring approximately ____ % of duty time.

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B. Objectives and Methodology: (for next 3-4 years)

Objectives are to:

Of particular significance is incumbent's current studies on:

Methods and approaches employed are best characterized as [ ] routine [ ] unusual [ ] novel [ ] sophisticated [ ] requiring considerable modification, because:

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C. Expected Results:

Successful research should result in:

For continuing assignments, there is [ ] little [ ] good, [ ] excellent evidence that substantial progress is being made.

Results [ ] are [ ] are not reflected as accomplishments and/or advisory/consultant activities.

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The panel assigned Degree ____ for this factor because:

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FACTOR II - SUPERVISION RECEIVED

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A. Assigned Authority: (freedom to make decisions within scope of assignment)

Within the [ ] specific [ ] identifiable [ ] broad [] unusually broad research assignment, incumbent has the freedom to:

Specific problems for study such as work on _____
are [ ] assigned by supervisor [ ] selected by incumbent subject to approval by supervisor
[ ] total responsibility of the incumbent.

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B. Technical Guidance Received: (extent of review by supervisor prior to conducting experiments)

Technical guidance involves:

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C. Review of Results: (extent of review/verification of results/findings by the supervisor)

Manuscripts and other reports are reviewed by the supervisor for:

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D. General Supervision:

[ ] Any [ ] Major [ ] Only broad change(s) in the research require(s) supervisor's approval.

Incumbent has responsibility for:

And freedom to:

Extent of supervision [ ] is [ ] is not consistent with the demonstrated capability of the scientist and the progress being made.

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The panel assigned Degree ____ for this factor because:

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FACTOR III - GUIDELINES AND ORIGINALITY

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A. Available Literature: (extent to which literature is available/relevant to the assignment)

Literature on _____

is available, but specific information on _____

is lacking.

Available techniques such as_____
[ ] are useful [ ] require minimal adaptation [ ] require major adaptation [ ] are unusable.

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B. Originality Required: (aspects which make planning/conducting research and interpreting results especially difficult)

Originality is required to:

The assignment is difficult because:

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C. Demonstrated Originality:

The **best** evidence of incumbent's originality is shown in his/her work on:

The originality required in this position [ ] is [ ] is not consistent with originality demonstrated by incumbent to date.

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The panel assigned Degree ____ for this factor because:

Exhibit 4 - ARS Form 517

RESEARCH EVALUATION SCORE SHEET		Date of Meeting
Name of Employee	Title	Series & Grade
Peer Group	Location	Area

EVALUATORS	ACCOMPLISHMENT RATING								FACTOR SCORES				
	1	2	3	4	5	6	7	8	I	II	III	IV	Tot
CONSENSUS ☞													

REMARKS (in any):

GRADE ☞